Traffic Safety
Problem Identification

FY 2005

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State Highway Traffic Safety Office
Montana Department of Transportation
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http://www.mdt.state.mt.us/trafsafety/

Contents

A. INTRODUCTION

This document was developed in order to identify and analyze trends and to evaluate problem areas related to traffic safety in Montana. The information contained within this publication originates primarily from traffic crashes occurring upon public roadways. Many contributing factors are discussed within this analysis. The demographics of the resultant injuries and fatalities along with the drivers and vehicles involved are presented. Rates are calculated using vehicle miles, licensed drivers or population when possible. The analysis is intended to provide traffic safety specialists with the information required to assist in the design of countermeasures for specific problems and in order to monitor progress in those areas.

Data is first presented on general exposure and demographics. Included in this are population statistics, driver license information, vehicle registrations, vehicle miles traveled and breakdowns of driver demographics in crashes. Information is then presented in specific problem areas and items of possible interest such as impaired driving; occupant protection; hazardous actions, speed and license compliance; traffic records; emergency medical services; young and senior drivers; and crashes involving motorcycles, pedestrians, bicyclists and trucks.

Current year data are compared to the previous year and also the average of the previous five years. Most tables contain ten years of data. The last two lines of a table usually contain the percentage change for these aforementioned comparisons.

The crash record system includes all motor vehicle crashes, which occur upon public roadways and are submitted to the Montana Highway Patrol by investigating officers. Crashes must involve at least one motor vehicle upon these public roadways. A bicyclist who crashes and injures himself would not be captured in the database unless a motor vehicle was also involved. A crash report is to be completed for any crash resulting in death, injury, or property damage amounting to $1000 or more. These incidents are termed reportable crashes. Some crashes such as single vehicle run off the road, wild animal crashes and minor fender benders are not reported to a law enforcement agency, even when there is more than $1000 of damage. The reporting level changed from $400 to $1000 on January 1, 2000. This may affect some comparisons, which examine total crash numbers. In addition, a short crash reporting form was introduced in 2001, which allows jurisdictions to fill this form out when there are no injuries involved. This, too, may have some negative affects upon the data.

The reporting by local law enforcement jurisdictions is voluntary. Fortunately, reporting is relatively complete for most jurisdictions. There are a few jurisdictions that don't send in all of their reports and efforts are continuing in order to improve the level of response from these jurisdictions. A few non-reportable crash reports are received by the Highway Patrol from individual citizens. These non-investigated reports are kept on file, but the data is not entered into the crash records database system.

The data elements within the crash record system include information on vehicles, roadway, drivers, passengers, pedestrians, bicyclists, and crash details. Some tables summarize crash counts, while others summarize the number of drivers, number of vehicles, number of occupants or number of injuries and these differences can be subtle and confusing. In addition sections of tables may concern all crashes while other sections contain data for fatal crashes or other subsets of data. Special care must be given by the reader to understand what exactly is being summarized within each table.

B. TRAFFIC CRASH AND EXPOSURE STATISTICS

The crash statistics in this publication relate to traffic crashes occurring within Montana's borders. The statistics include information on all persons involved in the crash regardless of residency.

Ten years of reportable crash and injury data appear in Table 1. Traffic crash and injury counts generally increased during the first seven years of the 1990's, then leveled. Crashes during 2003 were slightly lower than 2002, but the third highest of the past decade. Billings Police did not investigate many of their non-injury crashes from 1998 to 2000, which caused an undercount of 1000-2000 crashes during those years. Fatalities were seven lower during 2003 than in the previous year while fatal crashes were seven higher. Injury crashes decreased, and were the second lowest during the last ten years.

Table 1
Crashes by Severity

Year	All Crashes	Fatal Crashes	Injury Crashes	Property Damage Crashes	Fatalities	Injuries
1994	19,351	182	6,568	12,601	202	9,903
1995	20,508	186	6,807	13,515	216	10,255
1996	24,882	177	6,980	17,665	198	10,557
1997	22,619	223	6,951	15,445	265	10,688
1998	22,068	208	6,728	15,132	237	10,075
1999	21,078	194	6,769	14,113	220	10,459
2000	22,254	203	7,053	15,000	237	10,798
2001	21,846	201	6,220	15,420	230	8,982
2002	23,527	232	6,479	16,816	269	10,086
2003	23,160	239	6,229	16,681	262	9,632
Chg 1 Yr	-1.6%	+3.0%	-3.9%	-0.7%	-2.6%	-4.5%
Chg 5 Yr	+4.5%	+15.1%	-6.3%	+9.1%	+9.8%	-4.4%

Source: Traffic Information System (TIS) – Montana Department of Transportation

A Montana history of fatality numbers on public roadways is presented in the graph on the following page. The all time high in fatalities occurred during 1972. The number of fatalities was 395. The lowest number of fatalities since 1950 was 181, which occurred during 1989, the second year of Montana's seat belt law.

Montana crashes by severity type are represented graphically in Figure 2 on the page following Figure 1. Property damage crashes tend to vary greatly from year to year. Much of this variation results from differences in the amount of icy road conditions, especially in the urban areas. Property damage crashes were elevated particularly in 1996, because winter driving was present significantly more than during an average Montana winter.

Injury and severe injury crash counts tend to be more accurate indicators of safety trends in Montana. These crashes represent change without as much of the variation caused by icy roads. Severe injury crashes are defined as those crashes involving a fatality or an incapacitating injury.

Figure 1

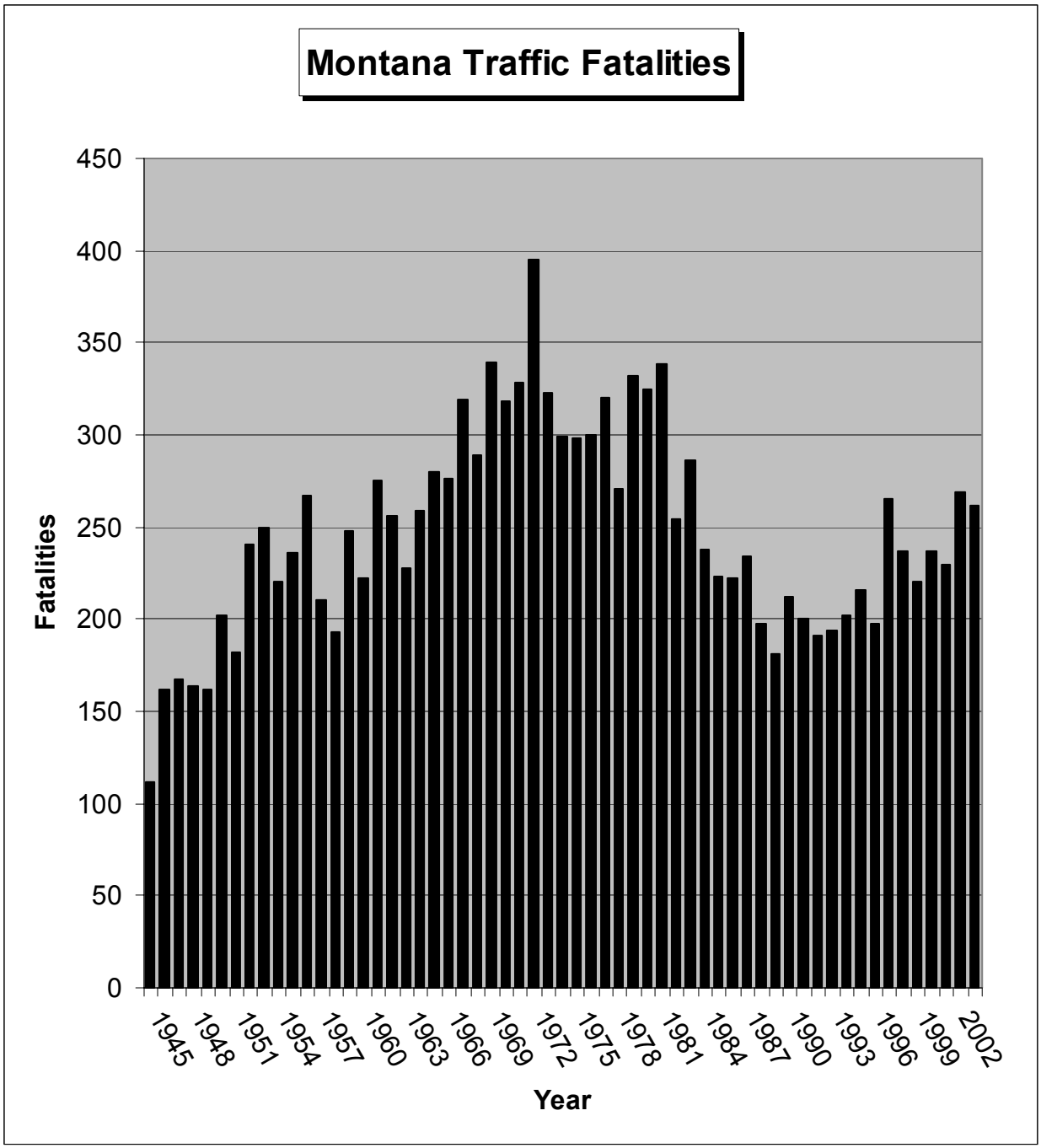
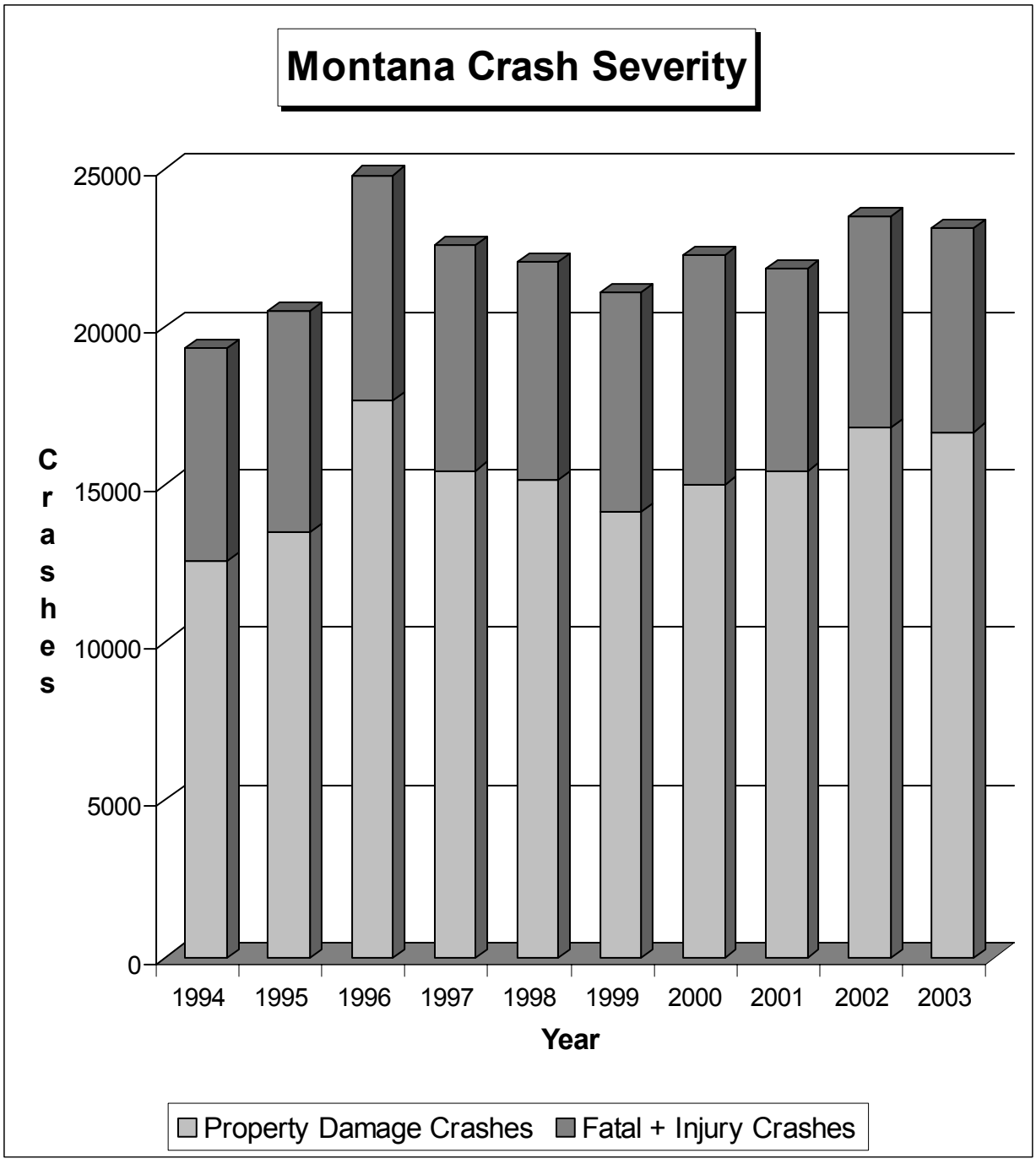

Montana Traffic Fatalities
Fatalities
450
400
350
300
250
200
150
100
50
0
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
Year

Figure 2


Montana Crash Severity
25000
20000
15000
10000
5000
0
Crashes
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
Year
Property Damage Crashes
Fatal + Injury Crashes

There are a number of exposure statistics in the area of traffic safety. These would include number and type of vehicles, number of licensed drivers by age and gender, physical road miles, population and the number of vehicle miles driven. Table 2 displays Vehicle Miles Traveled (VMT), which is the estimated number of total miles driven by all vehicles on Montana public roads, licensed drivers and registered motor vehicles. VMT is the exposure number that appears to have the greatest influence on the amount of traffic crashes that occur in Montana.

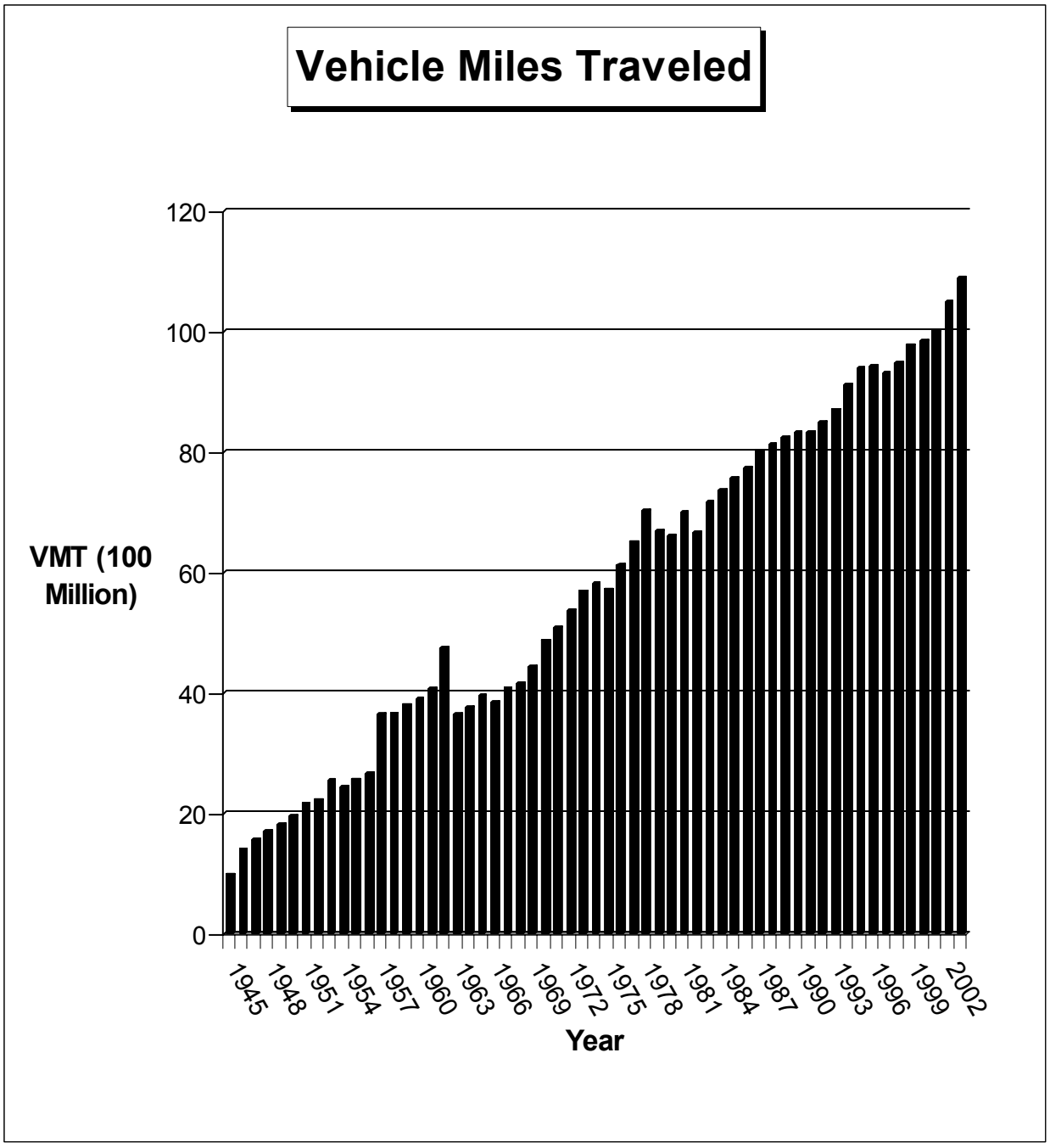
Table 2
Crash Exposure By Factors

Year	VMT (100 Million Miles)	Licensed Drivers	Registered Motor Vehicles (plus trailers)
1994	91.1	NA	984,946
1995	94.0	573,749	1,003,605
1996	94.2	NA	1,010,506
1997	93.2	NA	1,028,570
1998	94.9	646,512	1,042,183
1999	97.8	NA	NA
2000	98.6	678,899	1,009,930
2001	100.1	683,351	1,135,491
2002	104.9	694,743	1,165,808
2003	109.0	704,509	1,207,314
Chg 1 Year	+3.9%	+1.4%	+3.6%
Chg 5 Year	+9.8%	---	---

Source: VMT – Montana Department of Transportation
Drivers Licenses and Registered Vehicles – Department of Justice

The annual vehicle miles traveled are shown on the following chart. These numbers increase almost every year. During 1970, the VMT for Montana was 4.8 billion. Now in 2003, this figure is more than double at 10.9 billion miles traveled. When crash numbers, injuries and fatalities are stable, gains are still being made because of increases in exposure. During instances when decreases occur in these raw numbers, the actual gain is larger than is obvious when prorated by exposure.

Figure 3


Vehicle Miles Traveled
VMT (100 Million)
120
100
80
60
40
20
0
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
Year

The fatality rate for Montana was 7.64 fatalities per hundred million miles traveled during 1969. This rate has been generally decreasing since then. It had decreased to 4.92 in 1980. By 1996, this rate reached an all time low at 2.10. For the year 2003, the fatality rate was at 2.40.

The injury rate is 88.4 for the year 2003. This is down from 2002 and below all previous years. The crash rate was 212.5, which is below the rate for 2002.

Table 3
Statewide Crash Rates
(Per 100 Million Miles Traveled)

Year	Fatality Rate	Injury Rate	Crash Rate
1994	2.22	108.6	212.3
1995	2.29	109.1	218.2
1996	2.10	112.1	263.5
1997	2.84	114.7	242.6
1998	2.50	106.1	232.5
1999	2.25	106.9	215.4
2000	2.40	104.2	225.8
2001	2.30	89.7	218.2
2002	2.57	96.2	224.4
2003	2.40	88.4	212.5
Chg 1 Year	-6.6%	-8.1%	-5.3%
Chg 5 Year	-0.2%	-12.1%	-4.8%

Source: TIS and Traffic Data Collection - Montana Department of Transportation

* VMT is estimated so these rates are also estimated.

Historically, western rural states have tended to have rates that are above the national average, since a greater percentage of miles traveled are rural. During 2001, the United States rural fatality rate was 2.3 while the urban fatality rate was 1.0. For the nation, rural fatalities accounted for 61% of the traffic fatalities, while in Montana 90% of the fatalities are a result of rural fatal crashes. From this information, it stands to reason that the expected Montana rate would be much closer to 2.3 than the national rate of 1.5. Figure 4 compares the national fatality rate with the Montana rate.

Figure 4

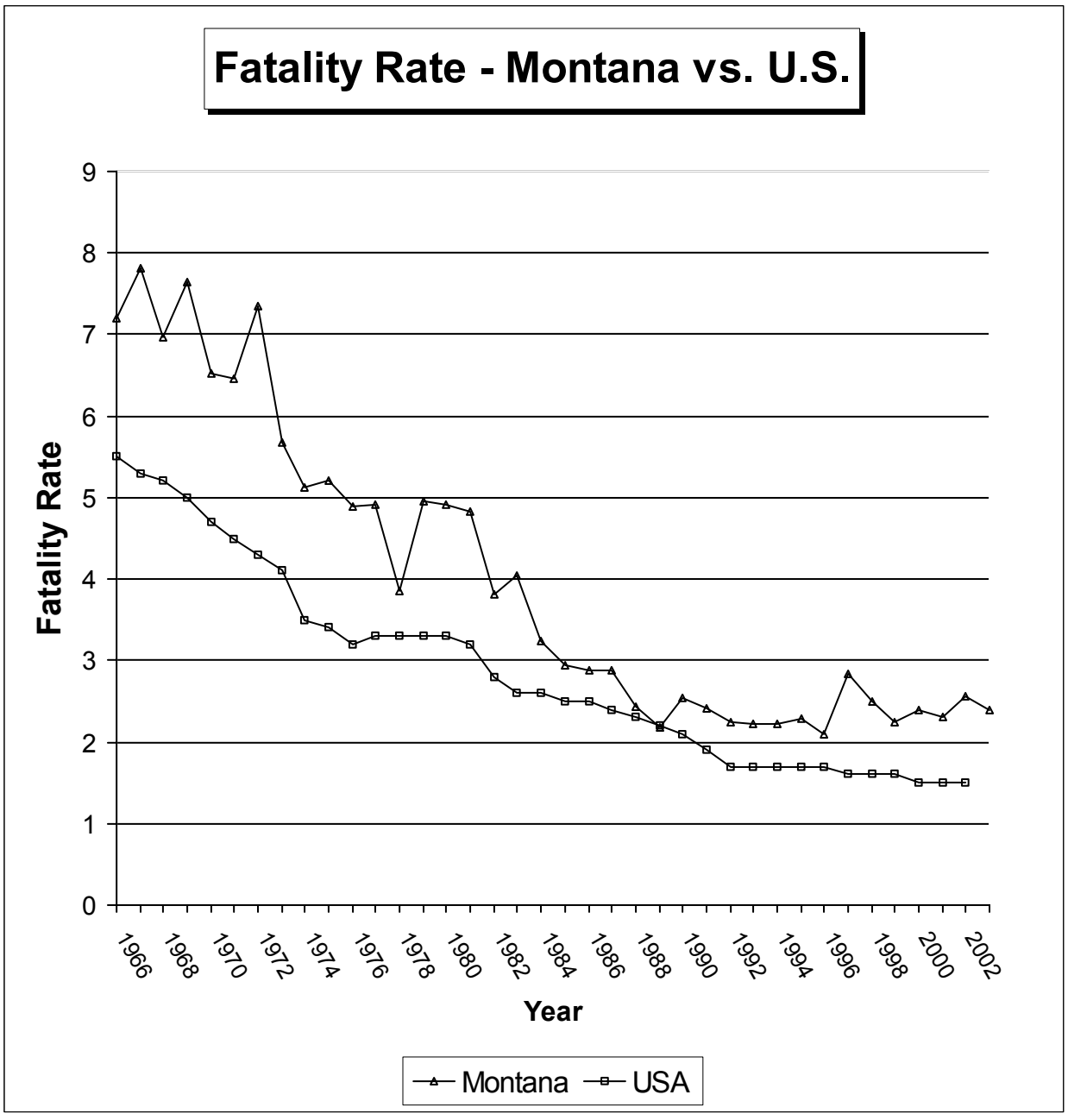

Fatality Rate - Montana vs. U.S.
Fatality Rate
0
1
2
3
4
5
6
7
8
9
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year
Montana
USA

Table 4 displays the distribution of injury severity to persons involved in motor vehicle crashes for the last ten years. This table examines injury severity to aid in determining whether restraint use and airbags are saving lives and reducing injury severity.

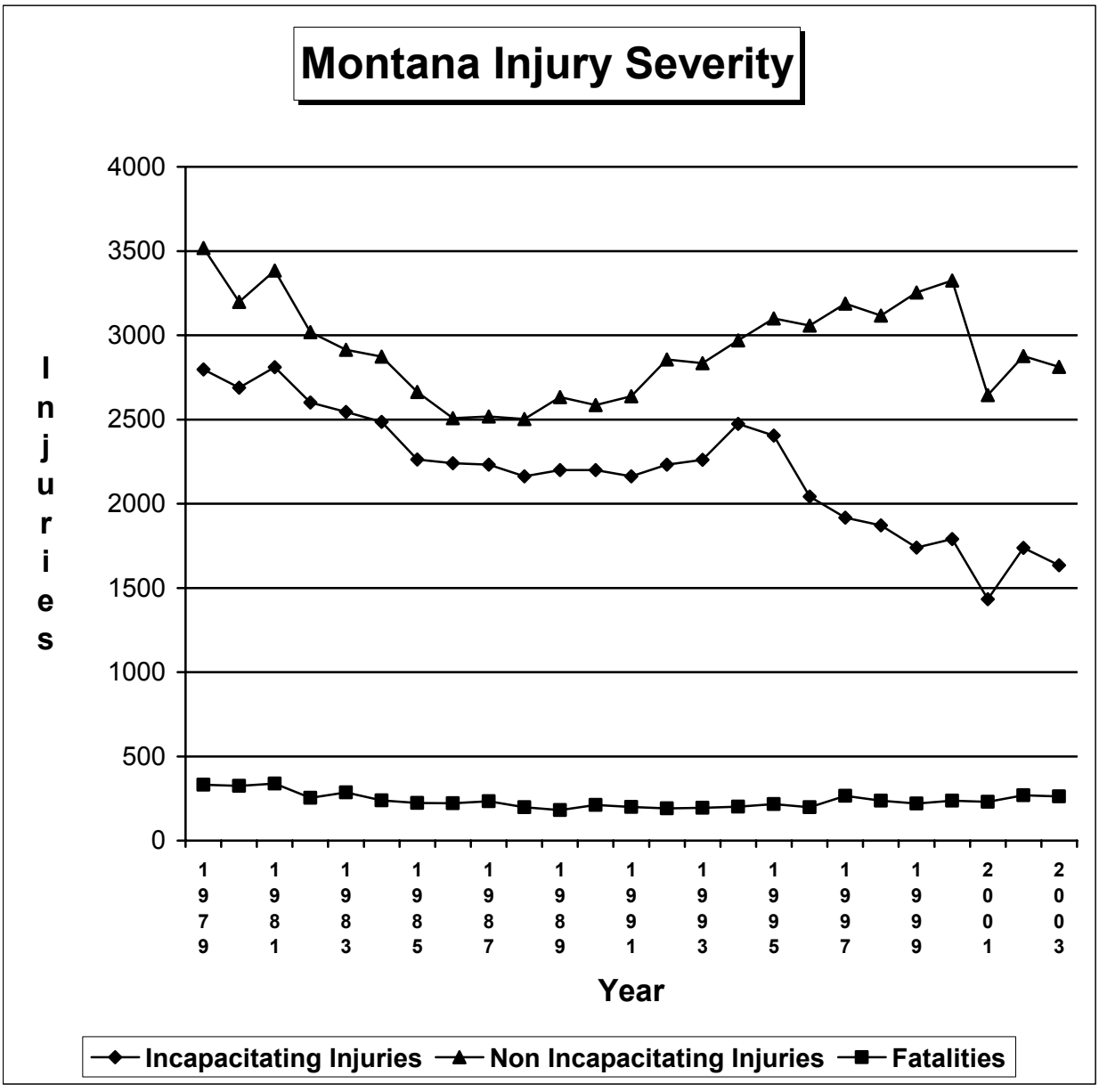
Table 4
Injury Severity
(persons)

Year	Fatalities	Incapacitating	Non Incapacitating	Possible Injury
1994	202	2,474	2,970	4,459
1995	216	2,405	3,099	4,751
1996	198	2,043	3,057	5,457
1997	265	1,917	3,187	5,584
1998	237	1,834	3,044	5,202
1999	220	1,739	3,254	5,466
2000	237	1,790	3,325	5,683
2001	230	1,433	2,645	4,904
2002	269	1,738	2,876	5,472
2003	262	1,634	2,812	5,186
Chg 1 Yr	-2.6%	-6.0%	-2.2%	-5.2%
Chg 5 Yr	+9.8%	-4.3%	-7.2%	-3.0%

Source: TIS - Montana Department of Transportation

Incapacitating injuries have decreased significantly (over 33 percent) during the past ten years. This number was lower in 2003 than during 2002, and lower than any recent year except for 2001. It would seem that occupant restraints, airbags and child restraints have accounted for at least part of this decrease. Severe injuries (fatalities plus incapacitating injuries) tend to be very costly in economic loss. This change downward in the number of severe injuries would appear to be the most significant change in the data within Montana during the last few years. Figure 5 on the following page shows clearly this history of injuries over time. This change in severity may also be changing because of more forgiving roadways and improved emergency medical services.

Figure 5


Montana Injury Severity
Injuries
4000
3500
3000
2500
2000
1500
1000
500
0
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Year
Incapacitating Injuries
Non Incapacitating Injuries
Fatalities

A comparison of crashes by rural or urban location is included in Table 5. The percentage of rural crashes in Montana decreased steadily in the 1980's and early 1990's. However that trend has leveled in the last ten years. During the last twenty years, many city dwellers have moved out into the country, but usually just outside of the cities. This may have some effect on the data.

The Billings Police Department did not report approximately 50% of their crashes during the period from 1998-2000, which decreased the number of urban crashes by 1000 to 2000 per year during that time. Reported crashes in Billings are now near levels during 1997. This dip affected the percentages for those three years.

Table 5
All Crashes -- Rural vs. Urban

Year	All Crashes	Rural Crashes	Urban Crashes	Percent Rural
1994	19,351	9,190	10,161	47.5%
1995	20,508	9,846	10,662	48.0%
1996	24,822	11,812	13,010	47.6%
1997	22,619	10,921	11,626	48.6%
1998	22,068	11,061	11,007	50.1%
1999	21,078	11,241	9,837	53.3%
2000	22,254	11,637	10,617	52.3%
2001	21,846	10,452	11,394	47.8%
2002	23,527	11,489	12,038	48.8%
2003	23,161	11,746	11,415	50.7%
Chg 1 Year	-1.6%	+2.2%	-5.2%	+3.9%
Chg 5 Year	+4.5%	+5.1%	+4.0%	+0.5%

Source: TIS - Montana Department of Transportation

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The following table looks at the same rural versus urban breakdown, but for fatal crashes in Montana. Fatal crashes occur mostly on rural roads within the state.

Table 6
Fatal Crashes -- Rural vs. Urban

Year	Fatal Crashes	Rural Fatal Crashes	Urban Fatal Crashes	Percent Rural
1994	182	170	12	93.4%
1995	186	157	29	84.4%
1996	177	158	19	89.3%
1997	223	208	15	93.3%
1998	208	180	28	86.5%
1999	194	176	18	90.7%
2000	203	185	18	91.1%
2001	201	187	14	93.0%
2002	232	209	23	90.1%
2003	239	214	25	89.5%
Chg 1 Year	+3.0%	+2.4%	+8.7%	-0.7%
Chg 5 Year	+15.1%	+14.2%	+23.8%	-0.9%

Source: TIS - Montana Department of Transportation

Rural crashes because of the speed involved tend to have many more fatalities and serious injuries than urban crashes. Twenty-six fatalities occurred on urban roads during 2003 from twenty-five different crashes. The other 236 fatalities occurred on rural roads from a total of 214 crashes. Similarly there were 260 incapacitating injuries on urban roads while 1374 of these serious injuries occurred in the rural setting.

Rural crashes averaged 1.3 vehicles per crash, while urban crashes averaged 2.0 vehicles. Crash configurations are much different. Most rural crashes (73.3%) involve just one vehicle, while most urban crashes (81.2%) involve two vehicles. Tables 7 and 8 on the following page tabulate rural and urban crashes by the number of vehicles involved. A large number of run off the road single vehicle crashes occur in the rural setting in Montana. City crashes tend to be collisions of multiple vehicles at or near intersections. These events tend to be multiple vehicles crashing at an angle or one vehicle striking the rear of another vehicle.

Table 7
Number of Involved Vehicles --- Rural vs. Urban Crashes – 2003

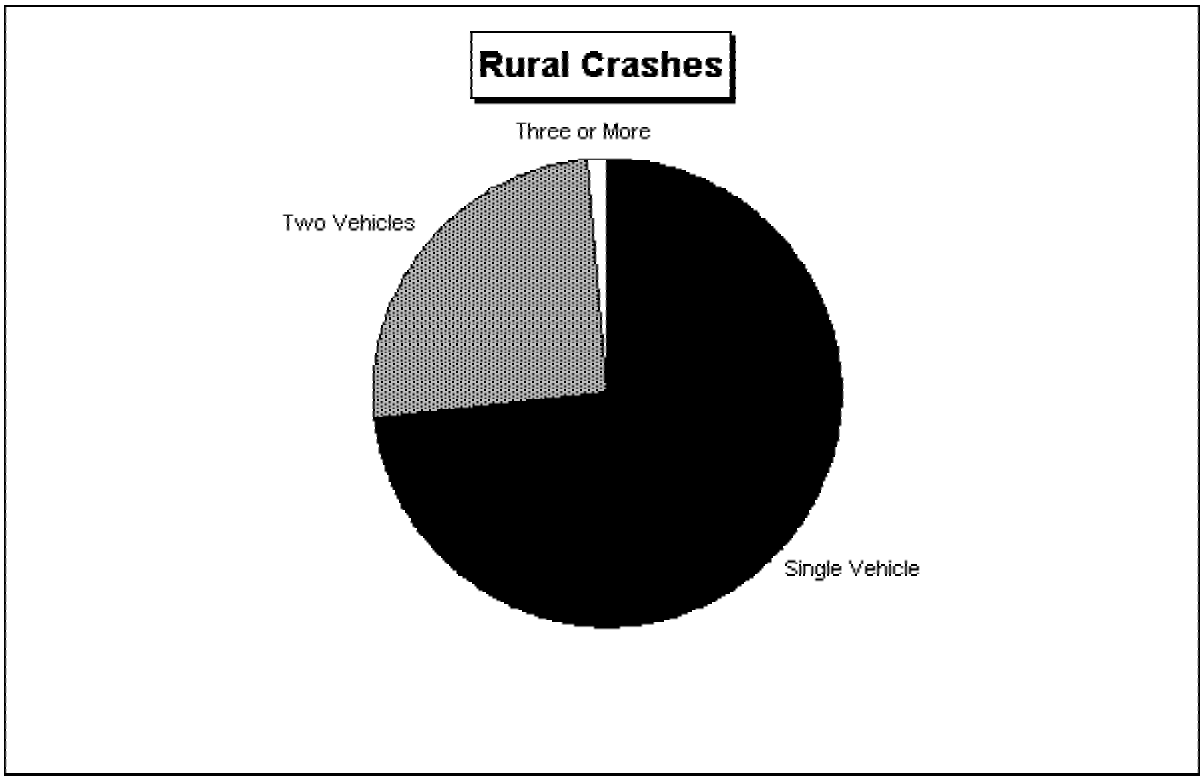
Vehicles	Rural		Urban		Total	
	Crashes	Percent	Crashes	Percent	Crashes	Percent
1	8,623	73.3%	1,312	11.5%	9,935	42.9%
2	2,955	25.2%	9,266	81.2%	12,221	52.7%
3	144	1.2%	734	6.4%	878	3.8%
4	18	0.2%	89	0.8%	107	0.5%
>=5	6	0.1%	14	0.1%	20	0.1%
Total	11,746	100.0%	11,415	100.0%	23,161	100.0%

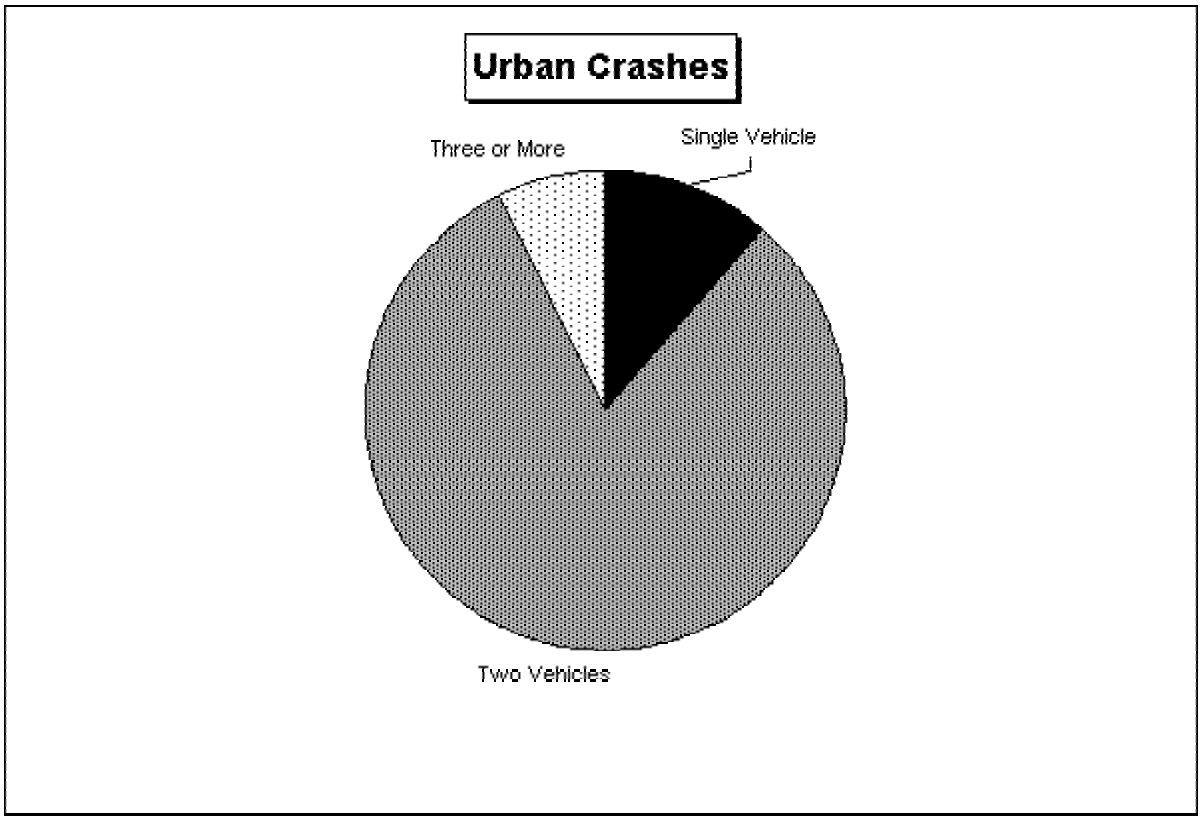
Table 8
Number of Involved Vehicles --- Rural vs. Urban Fatal Crashes – 2003

Vehicles	Rural		Urban		Total	
	Fatal Crashes	Percent	Fatal Crashes	Percent	Fatal Crashes	Percent
1	151	70.6%	10	40.0%	161	67.4%
2	54	25.2%	13	52.0%	67	28.0%
3	7	3.3%	2	8.0%	9	3.8%
4	2	0.9%	0	0.0%	2	0.8%
>=5	0	0.0%	0	0.0%	0	0.0%
Total	214	100.0%	25	100.0%	239	100.0%

The figure on the following page shows the number of vehicles by percentage in both rural and urban situations.

Figure 6


Rural Crashes
Three or More
Two Vehicles
Single Vehicle


Urban Crashes
Three or More
Single Vehicle
Two Vehicles

When examining type of collision for multiple-vehicle crashes in rural incidents, rear end collisions were most numerous. Right angle crashes and sideswipe crashes were next. These collision-types accounted for over 75% of the total. For Urban areas, right angle crashes were the most common collision type, followed by rear end crashes and other collision types. Rear end and right angles crashes accounted for over 67% of these urban crashes.

Table 9
Type Of Collision --- Rural vs. Urban Crashes - 2003
(Two or More Vehicles)

Type of Collision	Rural		Urban	
	Crashes	Percent	Crashes	Percent
Rear End	1057	34.0%	3,124	30.4%
Sideswipe – Same Direction	399	12.9%	690	6.7%
Sideswipe – Opposite Direction	260	8.4%	201	2.0%
Left Turn – Same Direction	71	2.3%	134	1.3%
Left Turn – Opposite Direction	86	2.8%	391	3.8%
Right Angle	685	22.0%	3,782	36.8%
Right Turn – Same Direction	23	0.7%	85	0.8%
Right Turn – Opposite Direction	10	0.3%	48	0.5%
Head On	221	7.1%	149	1.5%
Other	295	9.5%	1,666	16.2%
Total	3,107	100.0%	10,270	100.0%

Economic loss from motor vehicle crashes is shown for recent years in Table 10. The Montana Highway Patrol calculates these losses using estimates for average crashes, injuries and fatalities, which are provided by the National Safety Council. These estimates cover wage loss, medical expense, insurance administration and property damage costs. Indirect costs for human suffering and loss are more intangible and are not included as part of this estimate.

Table 10
Economic Loss in Crashes
(Millions of Dollars)

Year	Economic Loss
1995	$479
1996	$476
1997	$509
1998	$591
1999	$677
2000	$712
2001	$648
2002	$757
2003	$780
Change 1 Year	+3.0%
Change 5 Year	+15.2%

Source: Montana Highway Patrol

Economic loss due to traffic crashes increased slightly in 2003 even though fatalities and serious injuries were lower. Last year the economic loss for Montana crashes was just over three-quarters of a billion dollars. That is an average of over $800 for every citizen in Montana. Over 170 million dollars of loss were the result of alcohol related crashes.

Table 11 shows vehicle miles traveled (VMT) for 2003 and crash and injury rates based on VMT for each county. VMT was obtained for on-system roads in Montana from the Traffic Data Collection Section of the Montana Department of Transportation. The VMT for Montana off-system roadways was estimated by prorating the remaining mileage on a population basis. This estimate is then added to the MDT on-system estimate for each county. This final county estimate, although reasonable, is merely a rough estimate. Counties are grouped according to population size within the table. An 'x' is shown at right for counties that are fifteen percent above the group average for either of the two rates. It should be noted that for the nine counties with a population over 20,000 there occur 69.7% of the crashes in Montana and 67.6% of the injuries.

Table 11

Crash and Injury Rates by County – 2003

County	Population (2003)	Vehicle Miles (2003) (millions)	Crashes	Crash Rate (per million)	Injuries	Injury Rate (per million)	
Population greater than 20,000							
Yellowstone	133,191	1,131.5	3,539	3.13	1,345	1.19	X
Missoula	98,616	1,024.1	2,471	2.41	1,075	1.05	
Cascade	79,561	670.6	2,253	3.36	815	1.22	X
Flathead	79,485	885.8	1,973	2.23	937	1.06	
Gallatin	73,243	863.3	1,842	2.13	506	0.59	
Lewis & Clark	57,137	511.6	1,828	3.57	596	1.17	X
Ravalli	38,662	339.4	814	2.40	293	0.86	
Silver Bow	33,208	312.6	797	2.55	225	0.72	
Lake	27,197	349.7	613	1.75	336	0.96	
Total/Ave	620,300	6,088.6	16,130	2.65	6,128	1.01	
Population 10,000 – 19,999							
Lincoln	18,835	175.3	320	1.83	205	1.17	X
Hill	16,350	137.9	388	2.81	111	0.81	X
Park	15,840	258.6	465	1.80	167	0.65	
Glacier	13,250	136.8	173	1.26	106	0.77	
Big Horn	12,894	269.4	200	0.74	108	0.40	
Fergus	11,695	133.5	271	2.03	113	0.85	X
Custer	11,369	140.7	316	2.25	70	0.50	X
Jefferson	10,499	247.3	423	1.71	151	0.61	
Sanders	10,455	150.7	240	1.59	160	1.06	X
Roosevelt	10,451	105.5	143	1.36	102	0.97	X
Total/Ave	131,638	1,755.7	2,939	1.67	1,293	0.74	

.

Table 11 (continued)

Crash and Injury Rates by County – 2003

County	Population (2003)	Vehicle Miles (2003) (millions)	Crashes	Crash Rate (per million)	Injuries	Injury Rate (per million)	
Population 5,000-9,999							
Carbon	9,770	152.1	215	1.41	80	0.53	
Rosebud	9,303	140.5	166	1.18	66	0.47	
Richland	9,155	106.9	258	2.41	105	0.98	X
Deer Lodge	8,953	117.0	160	1.37	61	0.52	
Beaverhead	8,919	164.3	201	1.22	76	0.46	
Dawson	8,776	127.2	240	1.89	108	0.85	X
Stillwater	8,459	177.2	234	1.32	79	0.45	
Valley	7,349	95.1	152	1.60	56	0.59	
Powell	7,006	181.9	256	1.41	90	0.49	
Madison	6,967	139.5	175	1.25	60	0.43	
Blaine	6,729	78.4	92	1.17	45	0.57	
Teton	6,369	81.7	126	1.54	39	0.48	
Pondera	6,166	76.2	102	1.34	28	0.37	
Chouteau	5,576	86.6	77	0.89	26	0.30	
Toole	5,337	85.8	98	1.14	32	0.37	
Total/Ave	114,834	1810.4	2,552	1.41	951	0.53	
Population less than 5,000							
Musselshell	4,464	58.3	66	1.13	38	0.65	X
Broadwater	4,430	124.2	152	1.22	61	0.49	
Phillips	4,271	57.3	87	1.52	38	0.66	X
Mineral	3,884	214.3	310	1.45	93	0.43	X
Sheridan	3,668	38.4	59	1.54	16	0.42	X
Sweet Grass	3,604	144.1	148	1.03	75	0.52	
Granite	2,894	111.9	176	1.57	80	0.72	X
Fallon	2,752	36.2	19	0.53	9	0.25	
Judith Basin	2,192	61.5	59	0.96	36	0.59	
Wheatland	2,106	39.8	45	1.13	9	0.23	
Liberty	2,055	24.7	18	0.73	2	0.08	
Meagher	1,967	28.1	36	1.28	27	0.96	X
Daniels	1,940	21.3	36	1.69	12	0.56	X
Powder Rvr	1,834	43.0	57	1.32	24	0.56	
McCone	1,818	36.1	32	0.89	18	0.50	
Carter	1,333	31.0	16	0.52	18	0.58	
Garfield	1,233	27.3	24	0.88	35	1.28	X
Prairie	1,154	39.1	54	1.38	19	0.49	
Golden Vally	1,047	24.5	31	1.27	9	0.37	
Wibaux	977	28.6	37	1.29	24	0.84	X
Treasure	735	39.5	57	1.44	33	0.83	X
Petroleum	491	13.4	8	0.60	7	0.52	
Total/Ave	50,849	1242.6	1,527	1.23	683	0.55	

C. CRASH DEMOGRAPHICS

1. Gender of Drivers

Male drivers are more likely to be involved in crashes than female drivers, when prorated by the number of licensed drivers. However, when based upon average national vehicle miles driven by gender, this difference in crash rates largely disappears. No state statistics on miles traveled by gender are available. National estimates by gender are available and these estimates show that male drivers account for about 59-60% of the miles traveled.

Driver involvement in crashes by gender is shown in Table 12. While male involvement is 59.1% of all crashes, involvement by females has been increasing consistently over the past 20 years as female vehicle miles driven increases.

Table 12
Driver's Gender in Crashes

Year	Gender of Drivers			Percent of Total	
	Female	Male	Total	Female	Male
1994	11,745	18,661	30,415	38.6%	61.4%
1995	12,420	19,687	32,110	38.7%	61.3%
1996	14,932	23,326	38,258	39.0%	61.0%
1997	13,943	20,915	34,858	40.0%	60.0%
1998	12,818	19,382	32,200	39.8%	60.2%
1999	12,248	18,904	31,152	39.3%	60.7%
2000	13,237	20,008	33,245	39.8%	60.2%
2001	13,189	19,036	32,225	40.9%	59.1%
2002	14,606	21,052	35,658	41.0%	59.0%
2003	14,166	20,467	34,633	40.9%	59.1%
Chg 1 Year	-3.0%	-2.8%	-2.9%	-0.2%	+0.2%
Chg 5 Year	+7.2%	+4.0%	+5.3%	+1.8%	-1.2%

Men have a disproportionate involvement in fatal crashes. Past studies have shown that men have higher involvement in overturns, other non-collision crashes, crashes into fixed objects and the striking of animals. Much of this is due to men's much higher involvement in alcohol-related crashes. Table 13 follows with information on the gender of drivers in fatal crashes. Female involvement jumped sharply in 2003.

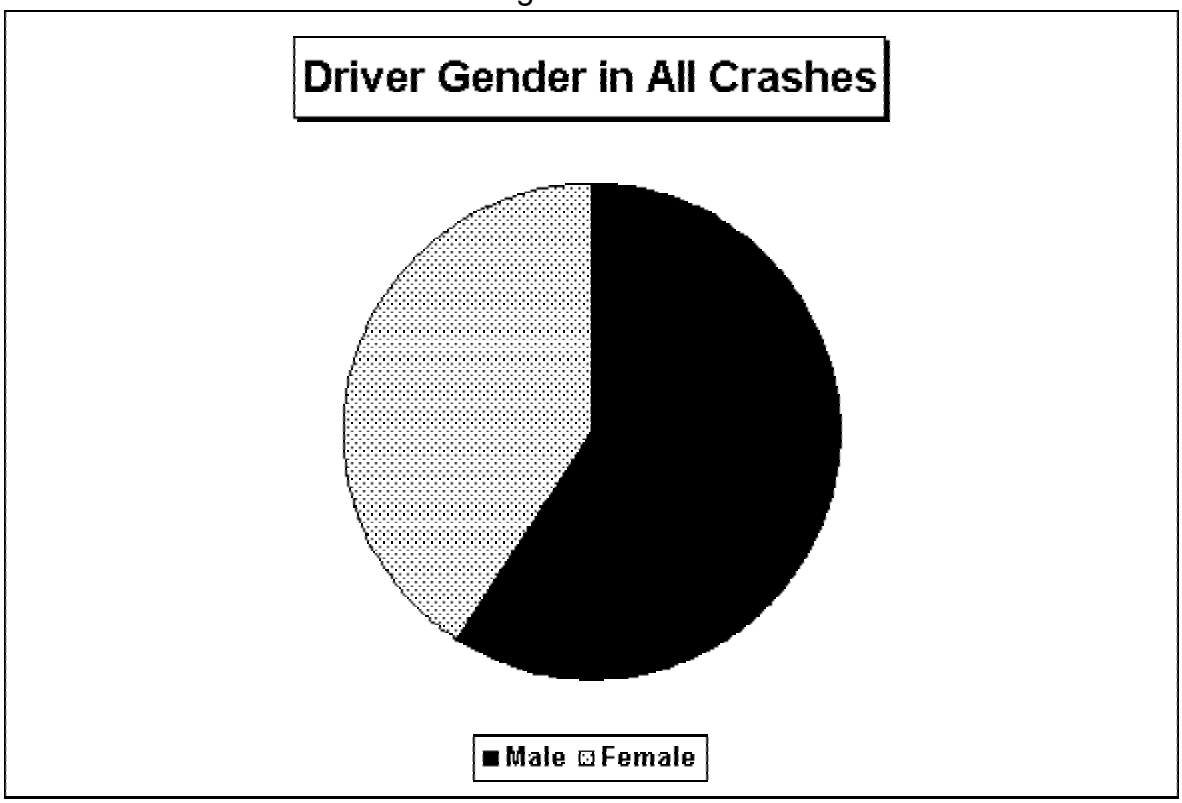
Table 13
Driver's Gender in Fatal Crashes

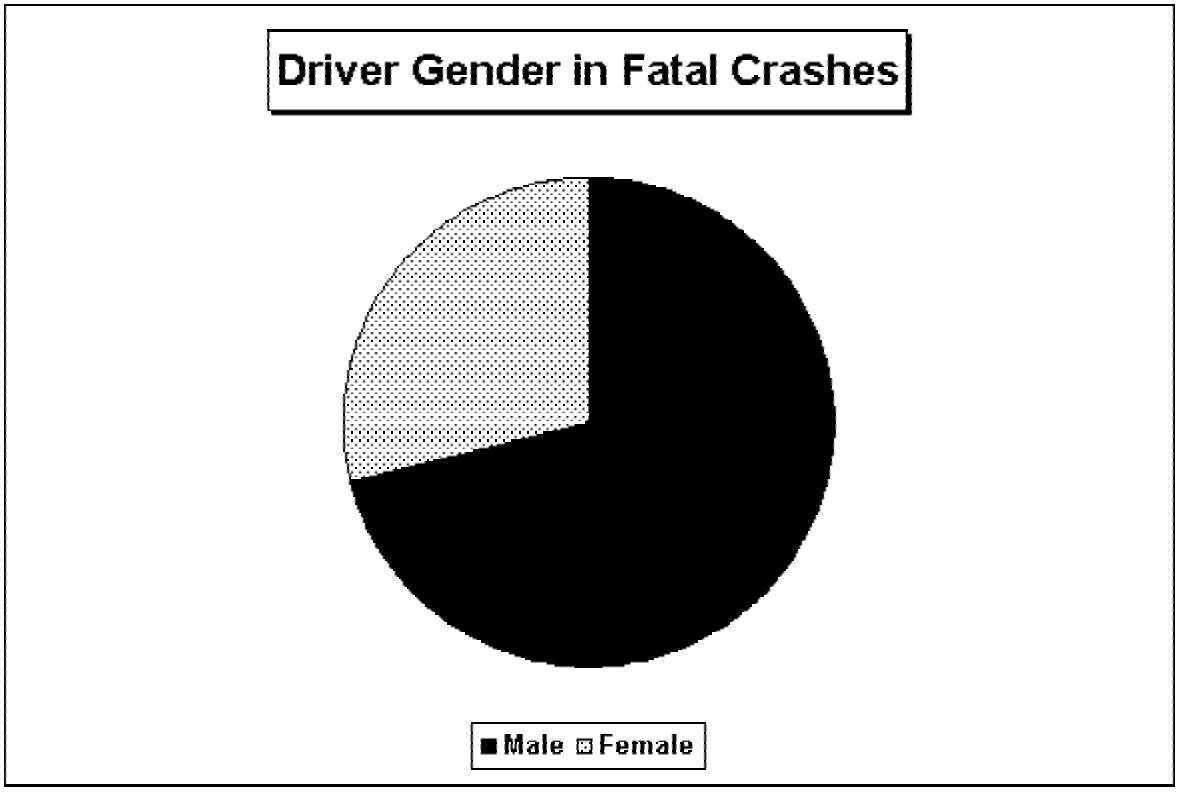
Year	Gender of Drivers			Percent of Total	
	Female	Male	Total	Female	Male
1994	76	173	249	30.5%	69.5%
1995	52	202	254	20.5%	79.5%
1996	71	177	248	28.6%	71.4%
1997	74	218	292	25.3%	74.7%
1998	68	213	281	24.2%	75.8%
1999	78	187	265	29.4%	70.6%
2000	77	225	302	25.5%	74.5%
2001	63	213	276	22.8%	77.2%
2002	71	248	319	22.3%	77.7%
2003	96	236	332	28.9%	71.1%
Chg 1 Year	+35.2%	-4.8%	+4.1%	+29.6%	-8.5%
Chg 5 Year	+34.5%	+8.7%	+15.0%	+16.3%	-5.4%

Source: TIS – Montana Department of Transportation

With the relatively small number of fatal crashes in Montana, the above percentages vary from year to year. It appears that during this ten-year period approximately 75% of the drivers in these crashes are male. Figure 7 on the following page displays the ratio of drivers by gender involved in all crashes and fatal crashes during 2003.

Figure 7


Driver Gender in All Crashes
Male
Female


Driver Gender in Fatal Crashes
Male
Female

2. Age of Drivers

This section examines the age of the drivers involved in traffic crashes. This information can assist those in the traffic safety community who are making decisions on targeting of specific age groups. Table 14 contains this age related data.

Table 14
Age of Drivers in Crashes

Year	Under 18	18-20	21-34	35-54	55-64	65-74	75
1994	3,738	3,315	9,347	9,283	2,002	1,535	1,189
1995	4,089	3,583	9,631	9,832	2,106	1,697	1,155
1996	4,139	4,054	10,885	12,427	2,542	1,954	1,301
1997	4,219	3,830	9,742	11,634	2,511	1,752	1,384
1998	3,827	3,674	8,720	10,728	2,349	1,639	1,270
1999	3,709	3,457	7,791	9,621	2,210	1,467	1,195
2000	4,024	3,985	8,845	11,015	2,644	1,590	1,304
2001	3,913	3,868	8,513	10,571	2,600	1,566	1,278
2002	4,037	4,187	9,663	11,725	2,931	1,810	1,348
2003	3,712	3,839	9,717	11,176	3,170	1,701	1,353
Chg 1 Year	-8.1%	-8.3%	+0.6%	-4.7%	+8.2%	-6.0%	+0.4%
Chg 5 Year	-4.9%	+0.1%	+11.6%	+4.1%	+24.5%	+5.4%	+5.8%

Source: TIS – Montana Department of Transportation
Motor Vehicle Division – Department of Justice

The number of drivers involved in crashes that are 55 and older has increased over the last ten years. It is not surprising that crashes are increasing within this group since the Montana population has increased in this same age group.

3. Gender of Injuries

Injury involvement by gender is shown below in Table 15. In 1997, females for the first time in Montana sustained more injuries than males resulting from traffic crashes. This occurred again in 2001. There has been a slow and steady increase in vehicle miles traveled for women nationally over the past few decades. This would explain the general increase in injury percentage. It is interesting that women are sustaining as many injuries as men, since they tend to wear restraints more than men and they, at least nationally, travel less vehicle miles. Men still account for about 70% of the fatalities. The percent of female fatalities appears to be decreasing over the last decade.

Table 15
Injuries by Gender

Year	Injuries			Fatalities		
	Female	Male	Percent Female	Female	Male	Percent Female
1994	4,791	5,114	48.4%	69	133	34.2%
1995	4,961	5,288	48.4%	70	145	32.6%
1996	5,206	5,346	49.3%	69	129	34.8%
1997	5,377	5,322	50.3%	97	168	36.6%
1998	4,634	4,871	48.8%	72	165	30.4%
1999	4,769	5,015	48.7%	73	147	33.2%
2000	4,957	5,305	48.3%	71	166	30.0%
2001	4,252	4,152	50.6%	65	165	28.3%
2002	4,648	4,798	49.2%	79	190	29.4%
2003	4,424	4,625	48.9%	78	184	29.8%
Chg 1 Yr	-4.8%	-3.6%	-0.6%	-1.3%	-3.2%	+1.4%
Chg 5 Yr	-4.9%	-4.2%	-0.4%	+8.3%	+10.4%	-1.5%

Source: TIS – Montana Department of Transportation

4. Age of Injuries

Injury involvement by age is shown below. There has been a significant trend downward for the under nineteen age groups. The age group between 55 and 64 has trended upward over the last few years. It should be noted that the 15-19 crash numbers are still very high, especially when you consider that all age groups over 25 include 10-year age segments compared to only five-year segments for those groups below 15 to 24.

Table 16
Injuries by Age (excludes fatalities)

Year	0-4	5-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75+
1994	197	783	2192	1398	1775	1433	873	495	356	316
1995	183	833	2365	1364	1739	1530	956	510	391	291
1996	213	812	2229	1311	1776	1677	1054	598	466	318
1997	323	798	2422	1331	1695	1611	1117	555	447	327
1998	283	729	2067	1236	1473	1398	1040	555	407	323
1999	288	732	2069	1220	1311	1430	1027	524	355	325
2000	249	804	2273	1368	1476	1459	1259	638	399	336
2001	216	578	1821	1103	1223	1285	1016	533	337	291
2002	226	682	1976	1277	1428	1383	1183	608	362	324
2003	232	668	1812	1291	1363	1203	1146	653	390	287
Chg 1 Year	+2.7%	-2.1%	-8.3%	+1.1%	-4.6%	-13.0%	-3.1%	+7.4%	+7.7%	-11.4%
Chg 5 Year	-8.1%	-5.2%	-11.2%	+4.0%	-1.4%	-13.5%	+3.7%	+14.2%	+4.8%	-10.3%

Source: TIS – Montana Department of Transportation

Fatalities by age are presented below in Table 17. Fatalities appear to be increasing in the age groups from 45 to 64. The table presents ten years of data with the ten-year average reported for each age group on the bottom line.

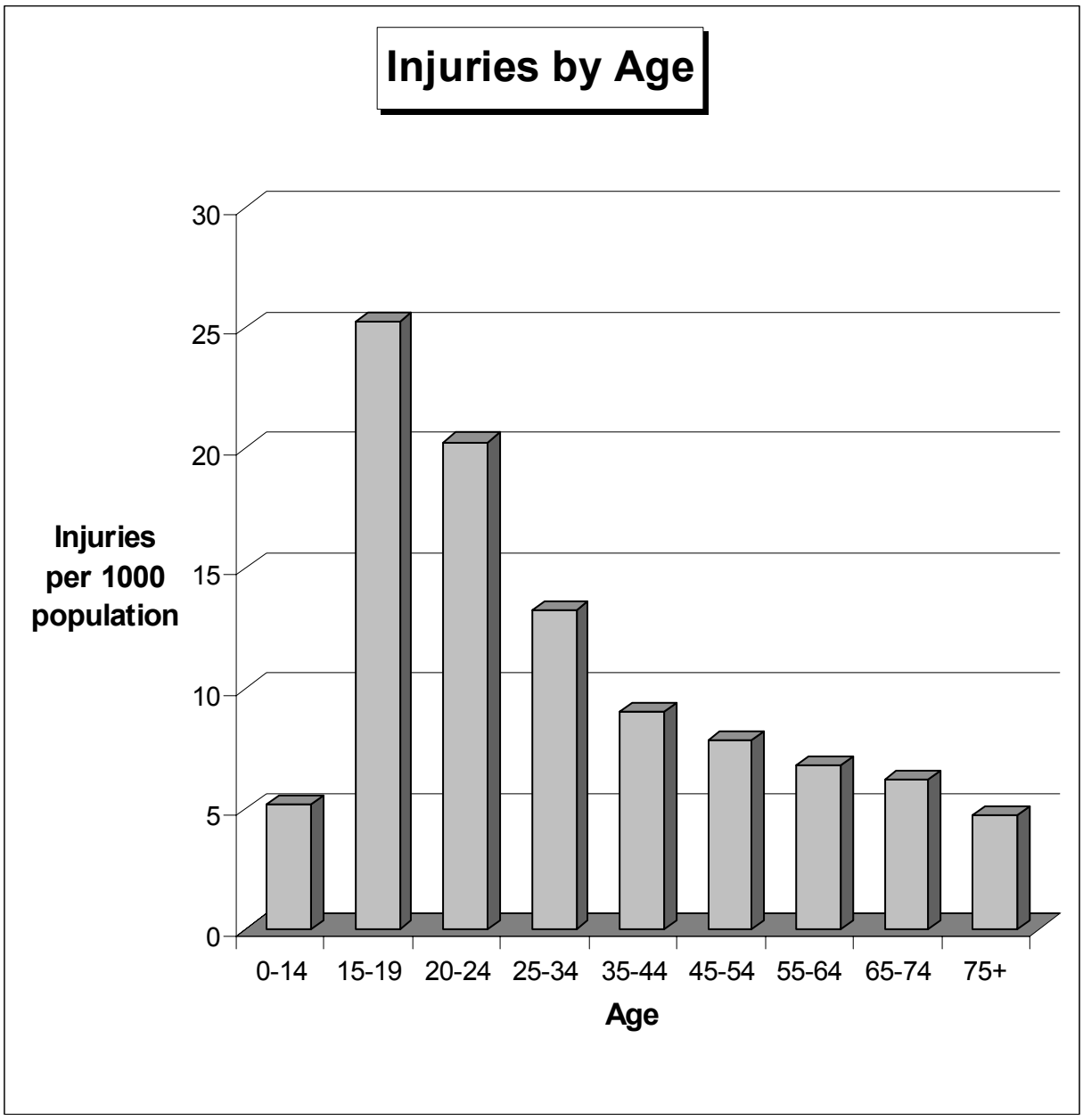
Table 17
Fatalities by Age

Year	0-4	5-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75+
1994	9	7	30	21	40	30	26	9	13	17
1995	4	14	27	17	36	34	24	22	14	23
1996	6	6	19	33	29	37	25	13	13	17
1997	7	6	35	31	38	42	42	20	18	24
1998	3	7	29	26	32	41	34	18	20	27
1999	1	8	39	28	30	34	31	19	11	17
2000	4	15	37	27	44	33	26	22	12	17
2001	1	13	16	32	38	39	38	26	13	14
2002	1	7	37	28	38	36	51	27	22	20
2003	4	9	36	36	34	33	41	26	17	19
Ave	3.6	8.5	30.4	27.9	36.3	35.3	31.5	19.0	14.8	18.8

Source: TIS – Montana Department of Transportation

Figure 8 on the following page shows by age the rate of injuries per 1000 population. From this chart, it is quite evident from that greater danger exists for teens and young adults.

Figure 8


Injuries by Age
Injuries per 1000 population
30
25
20
15
10
5
0
0-14
15-19
20-24
25-34
35-44
45-54
55-64
65-74
75+
Age

5. Race

Montana has little diversity of race. The primary race is white which accounts for 90.6% of the population. American Indians account for 6.2%. The "Other" category accounts for 0.6% while Asians account for 0.5%. Two or more races make up 1.7%, blacks account for 0.3% and Hawaiian and Pacific Islanders make up 0.1%. Generally the two predominant races, which account for 96.8 percent of the population, are the only two that contain enough data to analyze in traffic safety. The only available crash data by race is from the Fatality Analysis Reporting System (FARS).

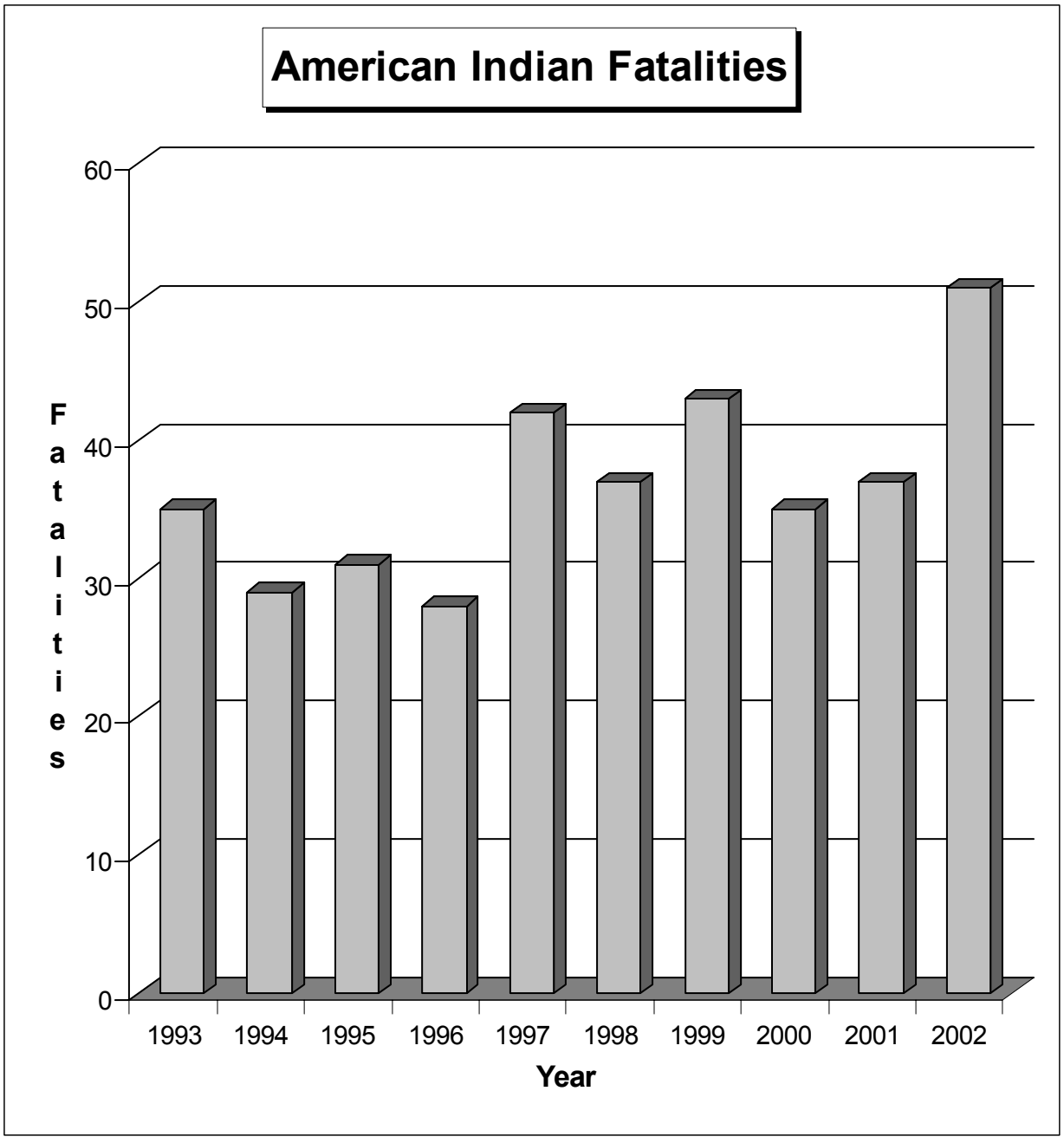
Table 18
American Indian Fatalities

Year	American Indian Fatalities	Total Fatalities	Percent of Total Fatalities	Indian Alcohol Related Fatalities	Percent of all Indian Fatalities
1993	35	194	17.9%	24	68.6%
1994	29	202	14.4%	24	82.8%
1995	31	216	14.4%	23	74.2%
1996	28	198	14.0%	19	67.9%
1997	42	265	15.8%	30	71.4%
1998	37	237	15.6%	21	56.8%
1999	43	220	19.5%	25	58.1%
2000	35	237	14.8%	26	74.3%
2001	37	230	16.1%	26	70.2%
2002	51	269	18.9%	33	64.7%

Source: FARS Database - MDT

During the past three years seat belt usage for Indian occupant fatalities has been less than 6 percent each year. Seat belt usage for other occupant fatalities has been just over 30%. Higher usage of protective devices would save some of these lives. Indian fatalities account for 14.0 to 19.5% of the total Montana fatalities, while accounting for only 6.2% of the population. Figure 9 displays Indian fatalities over the last few years.

Figure 9


American Indian Fatalities
Fatalities
60
50
40
30
20
10
0
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
Year

D. TRAFFIC SAFETY AREAS OF CONCERN

1. Impaired Driving

Alcohol/drug related crashes accounted for 9.4 percent of all reported traffic crashes during 2003. While this percentage is above the all time low reached in 1996, it is still far below the 22.3% of alcohol related crashes reported during 1983. A plateau has been reached in this percentage and it appears that it will take an even greater statewide effort to move it lower.

Alcohol/drug related crashes tend to result in more severe injuries than do crashes with no impairment. During the early 80's, fatalities related to alcohol accounted for as much as 62% of all fatalities. Last year, alcohol/drug related fatal crashes were at 38.9%. Economic Loss from driver impairment crashes was over 170 million dollars during 2003. Table 18 below presents the statewide alcohol related crash counts.

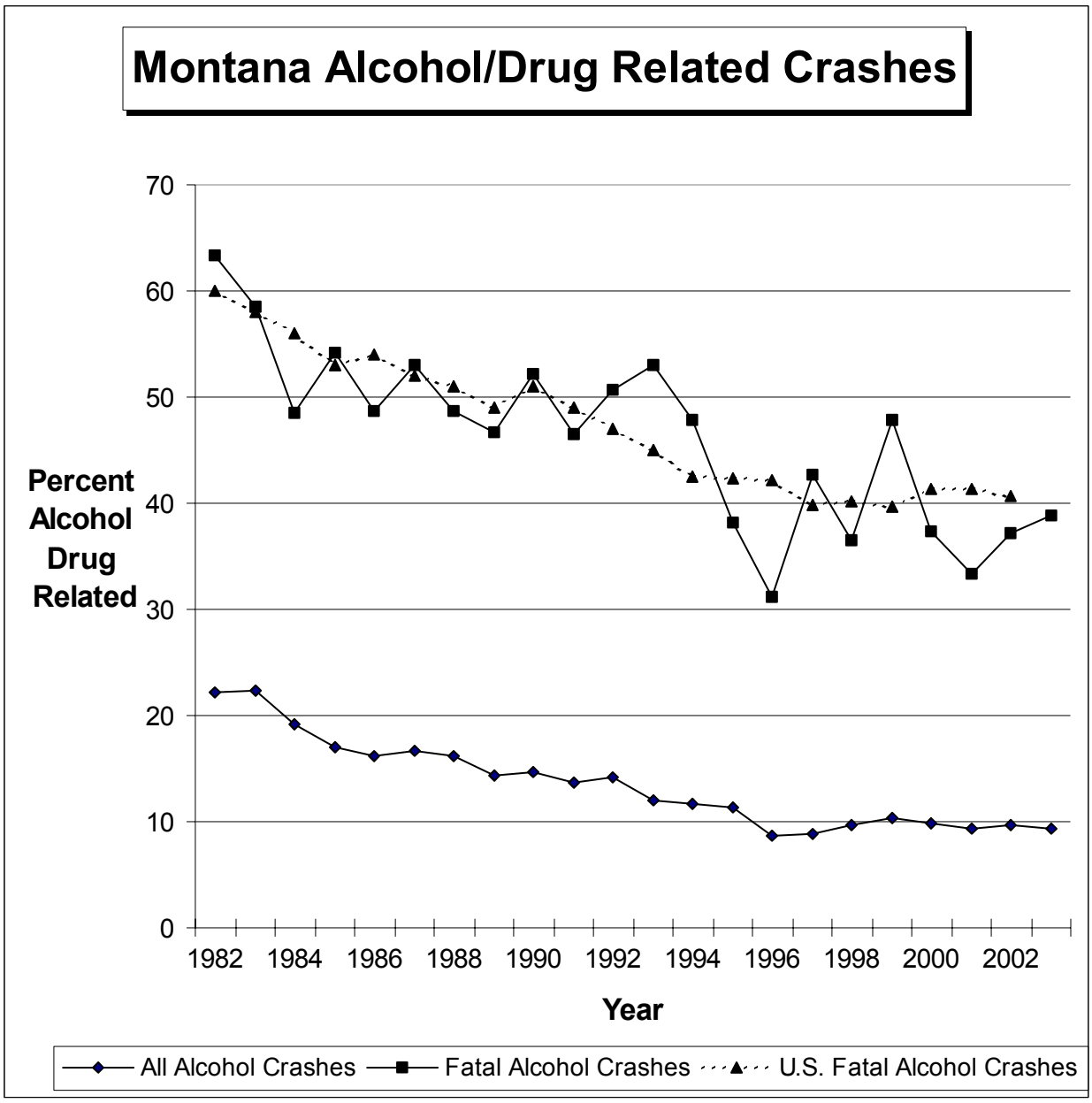
Table 19
Alcohol/Drug Related Crashes

Year	All Crashes			Fatal Crashes		
	Alcohol Related	All	Percent of All	Alcohol Related	All	Percent of All
1994	2,245	19,351	11.6%	87	182	47.8%
1995	2,313	20,508	11.3%	71	186	38.2%
1996	2,156	24,882	8.7%	55	177	31.1%
1997	2,016	22,619	8.9%	95	223	42.6%
1998	2,142	22,068	9.7%	76	208	36.5%
1999	2,177	21,078	10.3%	93	194	47.9%
2000	2,211	22,254	9.9%	76	203	37.4%
2001	2,035	21,846	9.3%	67	201	33.3%
2002	2,288	23,527	9.7%	86	232	37.1%
2003	2,173	23,160	9.4%	93	239	38.9%
Chg 1 Year	-5.0%	-1.6%	-3.1%	+8.1%	+3.0%	+4.9%
Chg 5 Year	+0.1%	+4.5%	-3.9%	+16.8%	+15.1%	+1.2%

Source: TIS - Montana Department of Transportation

Figure 10 on the following page compares the Montana percentage of alcohol related crashes with the national percentage.

Figure 10


Montana Alcohol/Drug Related Crashes
Percent Alcohol Drug Related
70
60
50
40
30
20
10
0
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year
All Alcohol Crashes
Fatal Alcohol Crashes
U.S. Fatal Alcohol Crashes

The National Highway Traffic Safety Administration (NHTSA) has moved away from placing emphasis on the percentage of fatalities that are alcohol related. NHTSA is now emphasizing the alcohol related fatality rate for each state. This rate is acquired by dividing the number of alcohol related traffic fatalities in Montana by the number of hundred million miles driven on Montana roadways. This data is compiled by NHTSA through the use of the Fatal Analysis Reporting System (FARS) database.

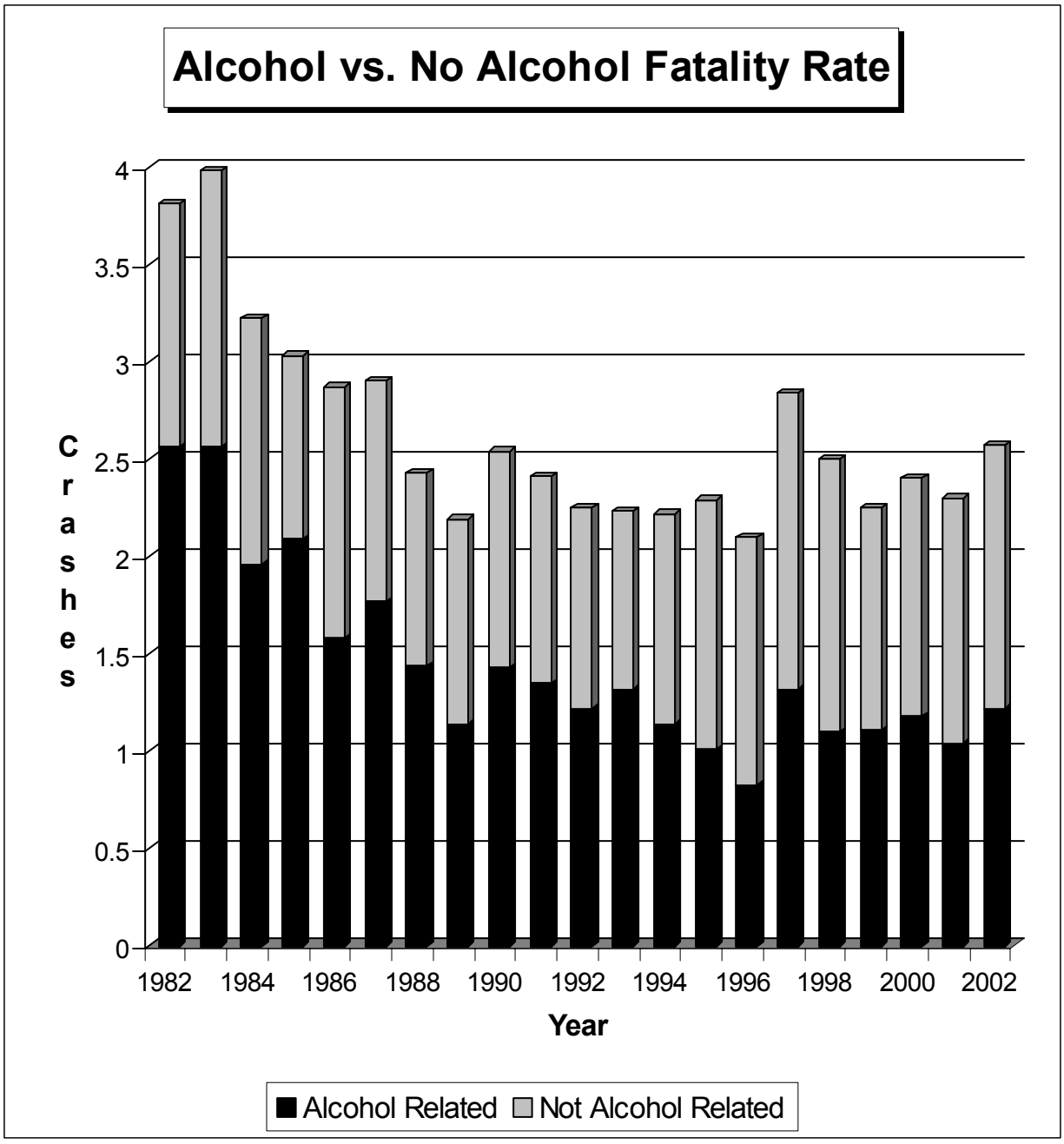
The number of alcohol related fatalities reported from the Montana Highway Patrol database and the number from the FARS database usually do not agree. The Patrol alcohol determination is based upon the officer's perceptions and observations at the scene. BAC tests are usually not available at this time. An unknown code is considered negative. The FARS database waits for the results of BAC tests from the Montana Forensics Lab. If no test is performed or received, the unknown alcohol code is generated using a number of other crash factors through a mathematical procedure. The FARS data is more accurate because it is based upon BAC results. Timeliness is the problem. MHP data is received within six weeks while FARS data is not received for one year. The data in Table 20 is based upon FARS data, while data related to alcohol in the rest of this paper is from the MHP database. The numbers in Table 20 are somewhat different because of this. Following this table, the graph in Figure 11 displays alcohol and non-alcohol fatality rates since 1982.

Table 20
Fatalities & Fatality Rates

Year	Total Fatalities	Alcohol Related Fatalities	Alcohol Related Percent	Total Fatality Rate	Alcohol Related Fatality Rate
1993	195	115	59	2.23	1.32
1994	202	104	52	2.22	1.14
1995	215	95	44	2.29	1.01
1996	200	78	39	2.10	0.83
1997	265	124	47	2.84	1.32
1998	237	105	44	2.50	1.10
1999	220	109	49	2.25	1.11
2000	237	117	49	2.40	1.18
2001	230	104	45	2.30	1.04
2002	269	127	47	2.57	1.22
Chg 1 Year	+17.0%	+22.1%	+4.4%	+11.7%	+17.3%
Chg 5 Year	+13.1%	+13.6%	+0.3%	+4.6%	+6.1%

Source: Fatal Analysis Reporting System

Figure 11


Alcohol vs. No Alcohol Fatality Rate
Crashes
4
3.5
3
2.5
2
1.5
1
0.5
0
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year
Alcohol Related
Not Alcohol Related

The fatality rate during 1983 was 3.98 while the alcohol related fatality rate was 2.56. So, during the last twenty years the alcohol rate has decreased more than 50%. Unfortunately, this level was reached in 1992 and during the last ten years the rate has been nearly level. The current alcohol related fatality rate for the nation is 0.61. This is exactly half of the value in Montana. During 2002, Montana had the highest alcohol related fatality rate in the entire nation, because South Carolina and Montana switched positions from 2001.

Next, we examine alcohol related crashes by county. The final column of Table 21 displays the percentage of crashes with alcohol involvement in the county. There is a tendency for the larger urban counties to have a lower percentage of alcohol involvement in crashes. It is not known whether this implies counties with higher populations truly have less alcohol involvement because of alcohol education and related activities, or whether the large number of fender benders at intersections makes the percentage of alcohol involvement lower. It is felt that these lower percentages result from a combination of these and possibly other factors. In addition, there are some enforcement agencies, which are not as precise in determining alcohol related involvement.

Table 21

Alcohol/Drug Related Crashes by County (2003)

County	Total Crashes	Fatal Crashes	Fatalities	Injuries	Percent Crashes Alcohol Related
Beaverhead	21	2	2	10	10.4%
Big Horn	21	3	3	21	10.5%
Blaine	13	2	2	3	14.1%
Broadwater	21	1	1	18	13.8%
Carbon	30	3	3	15	14.0%
Carter	3	1	1	5	18.8%
Cascade	173	5	5	141	7.7%
Chouteau	11	3	4	7	14.3%
Custer	15	0	0	9	4.7%
Daniels	7	0	0	7	19.4%
Dawson	13	0	0	12	5.4%
Deer Lodge	14	0	0	16	8.8%
Fallon	9	0	0	1	47.4%
Fergus	25	0	0	18	15.9%
Flathead	194	8	8	154	9.8%
Gallatin	149	4	5	84	8.1%
Garfield	2	0	0	2	8.3%
Glacier	29	5	5	33	16.8%
Golden Valley	8	0	0	2	25.8%
Granite	10	0	0	5	5.7%
Hill	49	0	0	37	12.6%
Jefferson	31	4	4	25	7.3%
Judith Basin	2	0	0	2	3.4%
Lake	97	8	12	87	15.8%
Lewis & Clark	143	1	1	105	7.8%
Liberty	1	0	0	0	5.6%
Lincoln	41	1	1	47	12.8%
Madison	29	0	0	20	16.6%
McCone	7	1	1	8	21.9%
Meagher	3	0	0	5	8.3%
Mineral	22	3	3	12	7.1%
Missoula	238	6	6	163	9.6%
Musselshell	7	0	0	9	10.6%
Park	39	3	3	24	8.4%
Petroleum	1	0	0	3	12.5%
Phillips	10	1	1	10	11.5%
Pondera	17	1	1	8	16.7%

Table 21 (continued

Alcohol Related Crashes by County

County	Total Crashes	Fatal Crashes	Fatalities	Injuries	Percent Alcohol Related Crashes
Powder River	3	0	0	2	5.3%
Powell	19	1	1	13	7.4%
Prairie	4	1	1	4	7.4%
Ravalli	63	2	2	58	7.7%
Richland	22	1	1	18	8.5%
Roosevelt	27	4	4	42	18.9%
Rosebud	17	0	0	10	10.2%
Sanders	28	1	1	29	11.7%
Sheridan	8	0	0	5	13.6%
Silver Bow	30	3	3	14	3.8%
Stillwater	22	2	2	15	9.4%
Sweet Grass	16	0	0	20	10.8%
Teton	15	1	1	14	11.9%
Toole	13	0	0	9	13.3%
Treasure	2	0	0	2	3.5%
Valley	21	2	2	16	13.8%
Wheatland	4	0	0	2	8.9%
Wibaux	4	0	0	8	10.8%
Yellowstone	356	9	9	209	10.1%
Total	2,173	93	97	1,638	9.4%

Source: TIS -- Montana Department of Transportation

Complete DUI arrest data is not readily available in Montana. Not all arrests result in a conviction for DUI, since some are dismissed or not prosecuted and others are found not guilty. In lieu of arrest data, we now present conviction data, which is gathered by the Department of Justice. Rates per 1000 population and per million vehicle miles traveled are included in Table 22. Total Convictions were somewhat lower during 2003 than the previous year.

Table 22
DUI Convictions

Year	DUI Convictions	Convictions per 1000 Population	Convictions per Million VMT
1994	6097	7.1	0.67
1995	6697	7.7	0.71
1996	6273	7.2	0.67
1997	6217	7.1	0.67
1998	5973	6.8	0.63
1999	6117	6.9	0.63
2000	5787	6.5	0.59
2001	5972	6.6	0.60
2002	5432	6.0	0.53
2003	5343	5.9	0.50
Chg 1 Year	-1.6%	-1.7%	-5.7%
Chg 5 Year	-8.8%	-10.1%	-16.1%

Source: TIS and Traffic Data Collection - Montana Department of Transportation

Data is presented for convictions by county and arresting agency in Table 23. This data is useful for local agencies and community leaders for the tracking of their local efforts. Of the 5,343 convictions during 2003, police departments wrote a total of 2,265 resulting convictions, which accounted for 42.4% of the total. Sheriff's Departments accounted for another 29.6% of the total.

Table 23

Montana DUI Convictions by Arresting Agency – 2003

County	MHP	Sheriff	Police	Total		County	MHP	Sheriff	Police	Total
Beaverhead	10	7	12	29		Meagher	2	7	0	9
Big Horn	49	49	0	98		Mineral	8	20	0	28
Blaine	10	31	1	42		Missoula	123	89	297	509
Broadwater	16	18	0	34		Musselshell	10	16	0	26
Carbon	16	13	19	48		Park	9	26	26	61
Carter	0	0	0	0		Petroleum	0	0	0	0
Cascade	62	56	239	357		Phillips	3	13	0	16
Chouteau	6	7	1	14		Pondera	10	3	2	15
Custer	12	6	45	63		Powder River	3	2	0	5
Daniels	1	1	0	2		Powell	6	12	0	18
Dawson	12	10	38	60		Prairie	4	4	0	8
Deer Lodge	14	36	0	50		Ravalli	18	115	52	185
Fallon	2	0	0	2		Richland	1	7	30	38
Fergus	16	7	24	47		Roosevelt	6	5	3	15
Flathead	122	63	214	399		Rosebud	9	27	0	36
Gallatin	97	133	419	649		Sanders	22	6	18	46
Garfield	1	1	0	2		Sheridan	2	6	1	9
Glacier	14	8	11	74		Silver Bow	34	152	0	186
Golden Valley	2	2	0	4		Stillwater	16	4	12	32
Granite	0	4	2	6		Sweet Grass	9	10	0	19
Hill	25	35	100	160		Teton	1	8	0	9
Jefferson	20	10	12	42		Toole	5	2	1	8
Judith Basin	10	1	0	11		Treasure	2	2	0	4
Lake	80	25	41	221		Valley	13	1	16	30
Lewis & Clark	48	60	204	312		Wheatland	3	4	0	7
Liberty	1	0	0	0		Wibaux	1	0	0	1
Lincoln	19	53	24	96		Yellowstone	184	132	394	710
Madison	13	12	5	30		Unknown	3	257	2	455
McCone	5	0	0	5		Total	1190	1579	2265	5343

Source: Department of Justice

** Totals do not add up because Tribal and Unknown Enforcement are not shown

Table 24 examines the age of the drivers that are involved in alcohol related traffic crashes. Crash rates per ten thousand licensed drivers is calculated. This information can help those in the traffic safety community make decisions on targeting specific age groups concerning the drinking and driving problem. It should be noted that not all drivers involved in these alcohol crashes were drinking. While most alcohol crashes are single car crashes, when there are multiple vehicles (about 680) involved, some of the drivers may have not been drinking. Therefore, a small percentage of the drivers (between 0 and 944) in this table were not drinking.

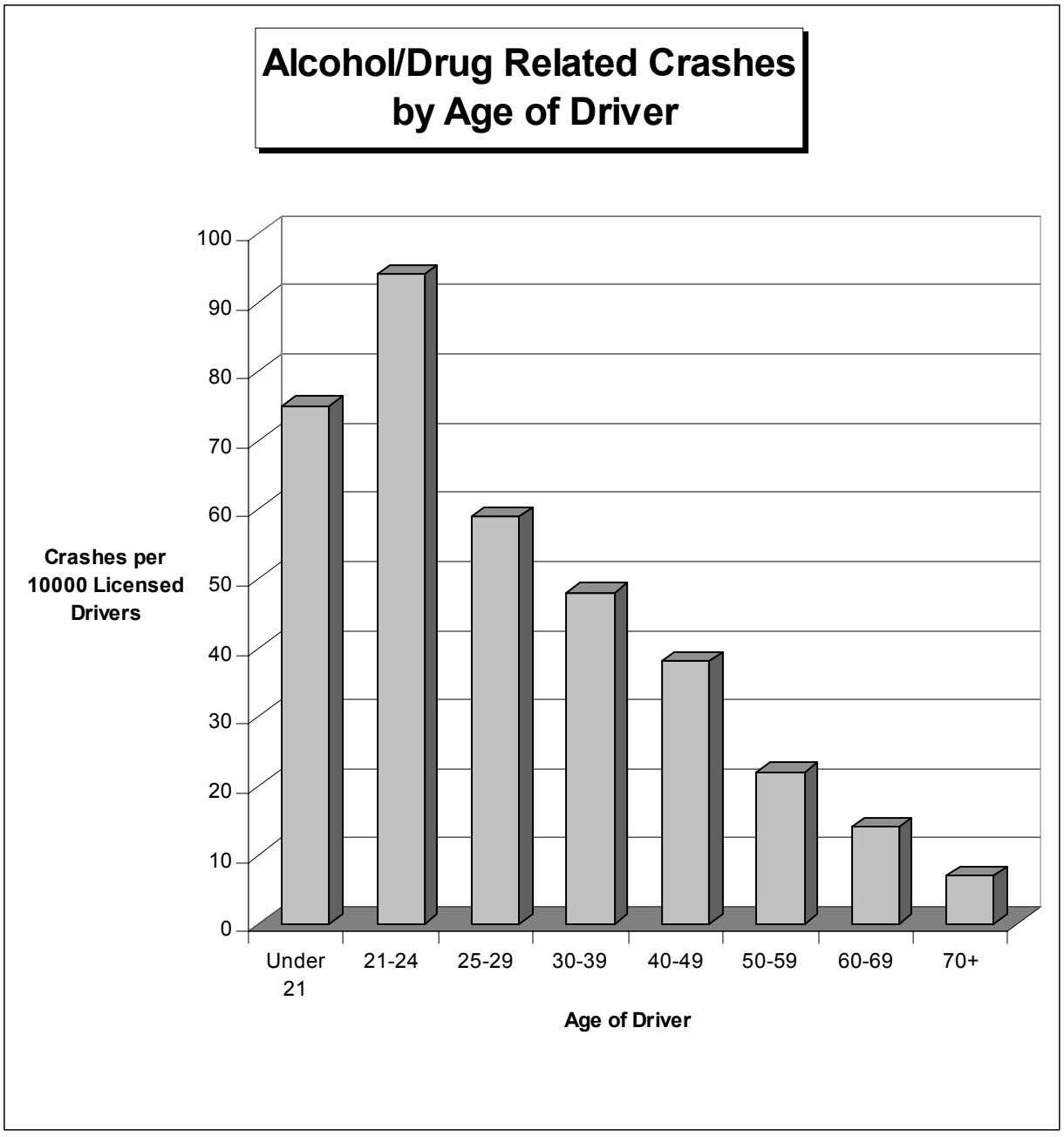
Table 24
Alcohol Related Crashes by Age of Driver
(2003 Crash Data)

Age	Licensed Drivers (2003)	Drivers in Alcohol Crashes	Alcohol Crashes per 10,000 Licenses	Drivers in Fatal Crashes	Fatal Crashes per 10,000 Licenses
Under 18	24,847	143	58	5	2.0
18-20	37,777	330	87	13	3.4
Under 21	62,634	473	76	18	2.9
21-24	47,804	452	94	23	4.8
25-29	57,076	335	59	12	2.1
30-39	111,301	536	48	16	1.4
40-49	146,406	554	38	27	1.8
50-59	128,235	279	22	15	1.2
60-69	79,139	112	14	6	0.8
70+	71,914	47	7	4	0.6

Source: TIS – Montana Department of Transportation
Motor Vehicle Division – Department of Justice

The highest involved age was the 21-24 year group. For all alcohol related crashes the 18-20 age group is a close second. Figure 12 on the next page shows these rates by age. It is interesting to compare this chart with Figure 19 on page 75, which shows rates by age for all crashes.

Figure 12


Alcohol/Drug Related Crashes by Age of Driver
Crashes per 10000 Licensed Drivers
100
90
80
70
60
50
40
30
20
10
0
Under 21
21-24
25-29
30-39
40-49
50-59
60-69
70+
Age of Driver

The table below examines "drivers" under age 21 involved in crashes. Those drivers involved in all crashes and in alcohol related crashes are compared. It should be emphasized that the counts are for drivers of age 20 and under (not crashes). There could be a few instances where the young driver had not been drinking, while another older driver involved in the crash had been drinking. Fortunately, most alcohol related crashes involve only one vehicle.

Underage drivers have a lower use of involvement in alcohol related crashes than the entire population of drivers. When young drivers are involved in crashes, 6.3% of those crashes involve alcohol, while the rate is 9.4% for all drivers regardless of age.

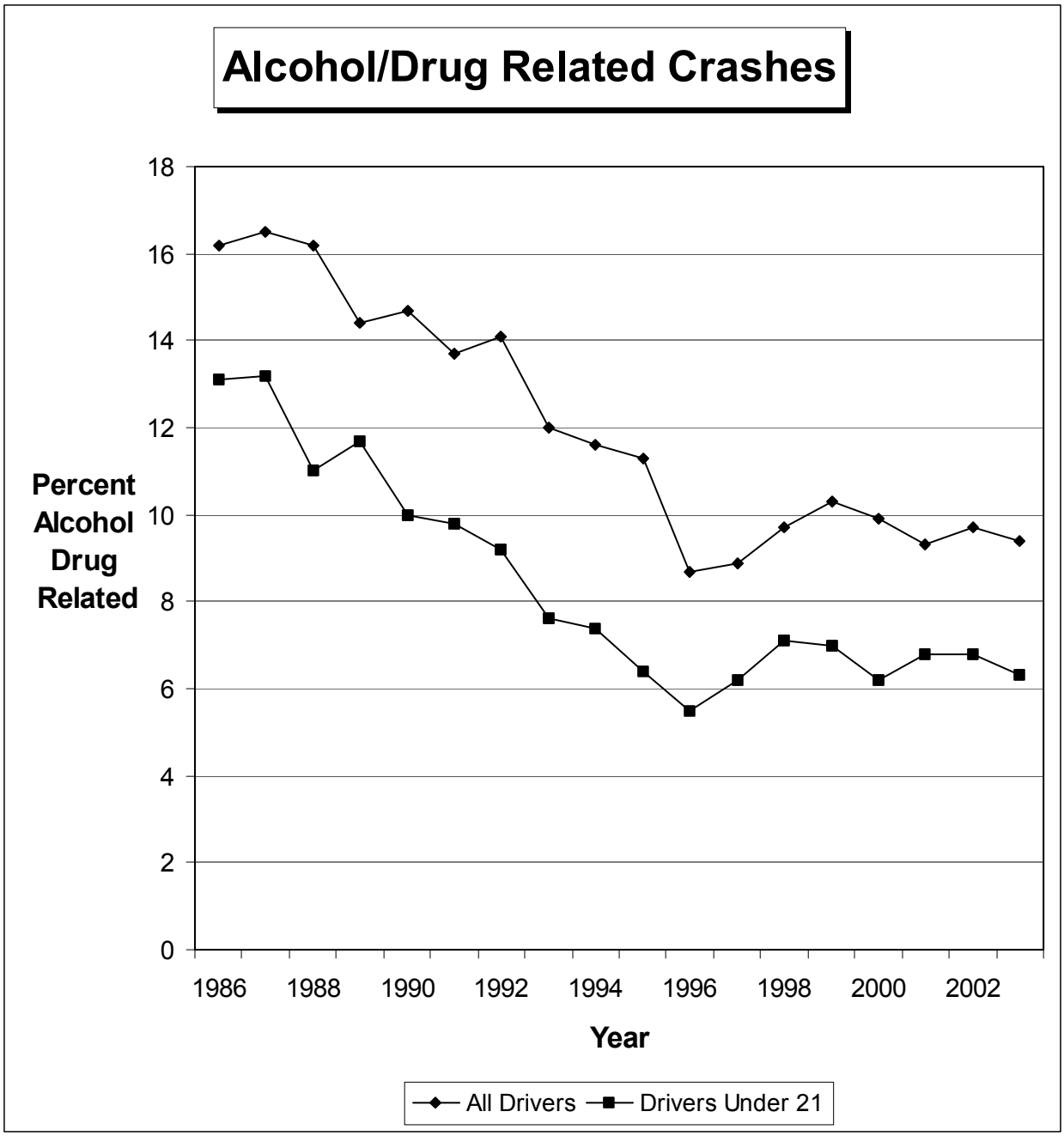
Table 25
Drivers Under 21 – Alcohol Related Crashes

Year	Drivers in All Crashes			Drivers In Fatal Crashes		
	Alcohol Related	All	Percent of All	Alcohol Related	All	Percent of All
1994	520	7,051	7.4%	21	54	38.9%
1995	492	7,672	6.4%	14	38	36.8%
1996	449	8,196	5.5%	16	46	34.8%
1997	491	7,958	6.2%	19	47	40.4%
1998	534	7,503	7.1%	14	44	31.8%
1999	497	7,064	7.0%	23	55	41.8%
2000	497	7,969	6.2%	13	49	26.5%
2001	531	7,781	6.8%	13	40	32.5%
2002	558	8,224	6.8%	16	47	34.0%
2003	473	7,551	6.3%	18	57	31.6%
Chg 1 Yr	-15.2%	-8.2%	-7.4%	+12.5%	+21.3%	-7.1%
Chg 5 Yr	-9.6%	-2.0%	-7.1%	+13.9%	+21.3%	-5.1%

Source: TIS – Montana Department of Transportation

Figure 13 on the following page examines these trends over time. A general decline for percentage of alcohol related crashes occurred until 1995. From 1996 until 2003, this percentage has leveled.

Figure 13


Alcohol/Drug Related Crashes
Percent Alcohol Drug Related
18
16
14
12
10
8
6
4
2
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year
All Drivers
Drivers Under 21

2. Occupant Protection

Montana's seat belt law became effective on October 1, 1987, without penalties. Penalties became effective on January 1, 1988. The law was written for secondary law enforcement and covered all seating positions within vehicles. Although, there must be another reason for stopping a vehicle, the law has been very effective. Montana is writing more tickets than was expected and more tickets than most states per capita. In addition, Montana is one of only fourteen states where all seating positions are covered. Only three standard enforcement states cover all positions. A bill for standard enforcement has been introduced to the Montana legislature during two sessions and has not been successful. It appears that there will be another attempt during the 2005 legislative session. There may be growing support for a standard enforcement law within the state.

Montana's restraint usage rates are shown on the next page in Table 26. These rates are determined from an approved NHTSA observational survey. The survey is currently conducted during the summer at 120 locations.

Montana restraint usage increased from 16.8% in 1984 to 33.3% in October 1987 before the mandatory seat belt bill became law. This gain was acquired by conducting seat belt incentive give away campaigns in many of Montana's cities during this period along with public information campaigns. When the enforcement of the law began, usage jumped to 56% and has gradually increased since that time. The current level of usage is 80.9%. The historical changes in usage for the last ten years appear in the table.

Restraint usage in Montana tends to have an annual cycle. Usage is usually two to three percentage points higher in summer than in winter. This cycle is likely caused by a greater percentage of short trips during the winter. Tourists are more prevalent in the summer accounting for a larger percentage of long trips and thereby higher usage. In addition, families traveling together tend to have higher usage than when there is just one person in the vehicle. A higher percentage of vehicles contain more than one person during the summer in Montana. Counteracting this somewhat is the fact that usage is at times higher on very icy roadways during the winter.

The usage rates on City and Other roadway strata types increased significantly during 2003 and 2004. These two road types have high crash rates but lower restraint usage rates, because of a tendency for short trips. Vehicle occupants may think that there is less chance of serious injury on these categories since the roads tend to handle local traffic and the traveling speed is sometimes slower. However, the chance of a crash is highest on these roads, and serious injury is still quite possible. Continued effort must be placed on the populations that are the primary users of these roadways. The Interstate category decreased slightly during the past year.

Table 26
Seat Belt Usage Rates

Year	Interstate	Primary	City	Other	All Roads
1984	24.7%	20.7%	8.4%	8.4%	16.8%
1985	30.6%	25.8%	9.7%	12.2%	21.7%
1986	43.4%	33.9%	14.8%	17.1%	29.5%
1987	54.8%	44.0%	24.0%	27.0%	39.7%
1988	75.8%	64.7%	41.2%	45.6%	59.5%
1989	78.6%	69.3%	40.6%	47.5%	61.8%
1990	79.1%	70.5%	40.2%	48.4%	62.6%
1991	80.9%	72.8%	41.4%	49.3%	64.5%
1992	83.1%	75.3%	47.8%	53.7%	68.0%
1993	84.2%	75.9%	49.6%	56.2%	69.2%
1994	84.7%	75.4%	51.1%	56.4%	69.6%
1995	86.4%	75.0%	51.3%	57.5%	70.1%
1996	86.2%	75.5%	51.8%	61.0%	70.8%
1997	87.9%	79.3%	52.4%	60.2%	72.6%
1998	88.4%	78.2%	54.0%	63.5%	73.1%
1999	89.1%	78.9%	55.3%	65.0%	74.0%
2000	91.3%	79.5%	58.3%	65.5%	75.6%
2001	92.5%	79.6%	59.7%	65.7%	76.3%
2002	94.3%	82.5%	60.8%	69.7%	78.4%
2003	93.6%	82.3%	65.1%	71.7%	79.5%
2004	93.0%	83.3%	67.7%	73.1%	80.9%
Chg 1 Year	-0.6%	+1.2%	+4.0%	+2.0%	+1.8%
Chg 5 Year	+0.9%	+3.4%	+13.1%	+8.3%	+5.4%

Source: TIS – Montana Department of Transportation

On the following page, Figure 14 shows a graph of Montana's increasing seat belt usage since 1983.

Figure 14

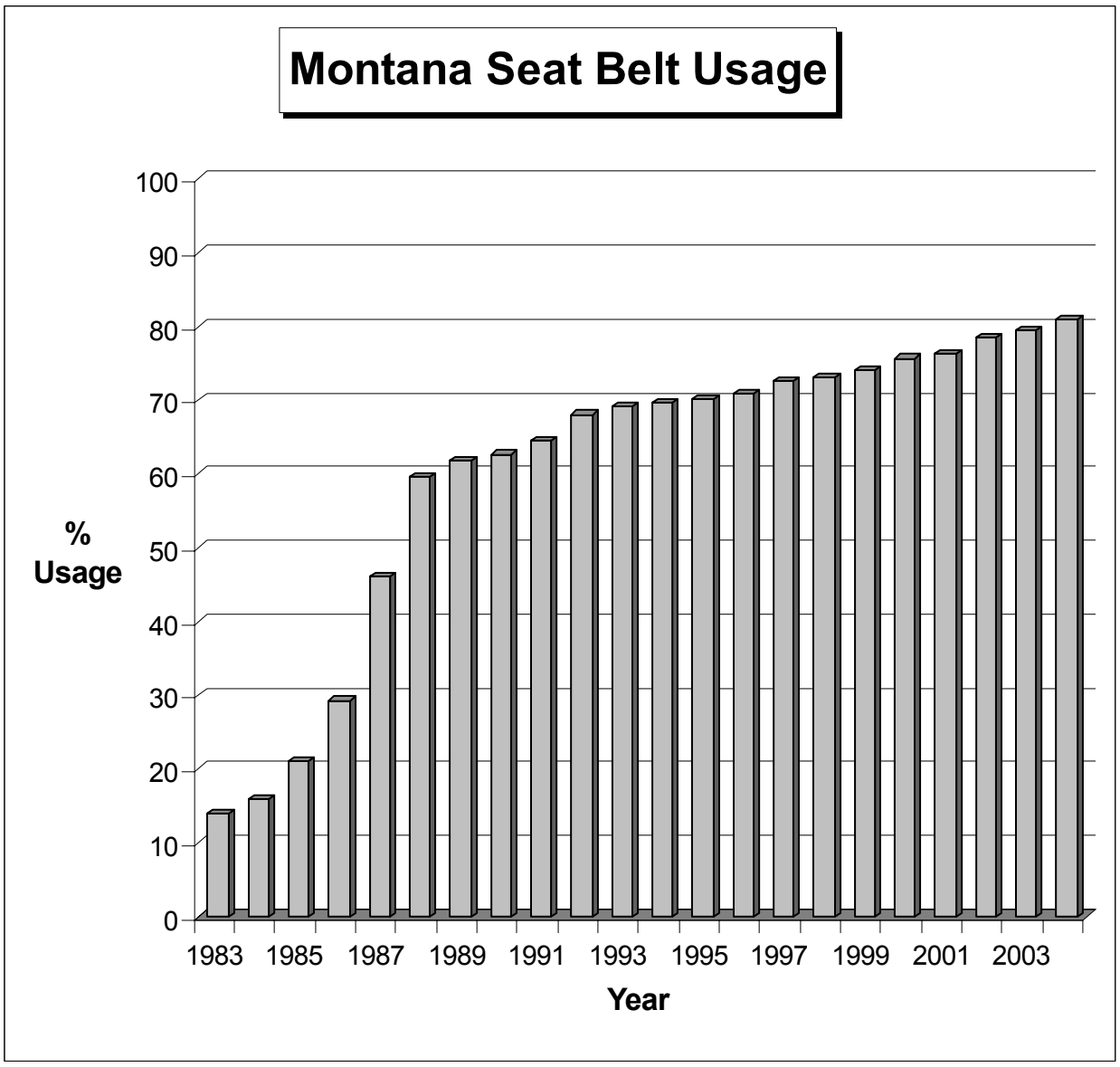

Montana Seat Belt Usage
100
90
80
70
60
50
40
30
20
10
0
% Usage
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
Year

Table 27 on the following page shows seat belt convictions by arresting agency. Nearly 16,000 convictions resulted from seat belt citations issued during 2003, which was the third highest total since 1988. This is significantly higher than the 12,200 convictions, which resulted from 2002 citations.

The Montana Highway Patrol wrote about 80% of the convictions statewide and they accounted for the increase of 2003 over 2002. Police departments accounted for over 15% of statewide citations, down significantly from 2002. Sheriff departments accounted for less than 5% of the statewide total. Greater increases in local enforcement may be needed in order to encourage higher usage on local roads and city streets.

Montana restraint usage has been growing slowly over the past few years. Most smaller local enforcement agencies, do not write significant numbers of seat belt citations. However Laurel, Miles City, Columbia Falls, Sidney and Baker do write a relatively large amount of citations for their size of community. The Bureau of Indian Affairs and/or Reservation Police issue very few citations that result in convictions. Restraint usage on most of Montana's reservations continues to be quite low.

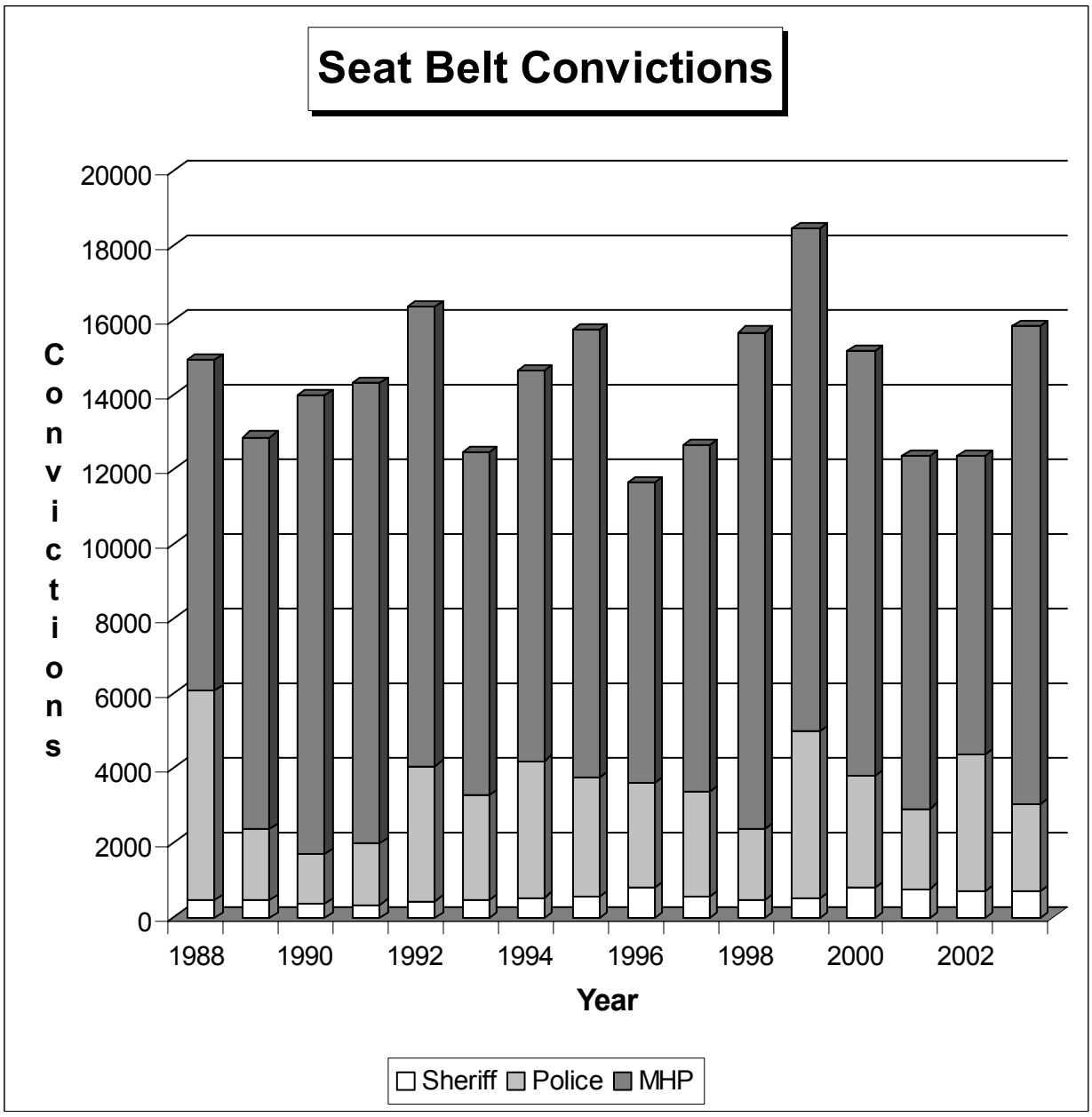
Table 27
Seat Belt Citation Convictions by Issuing Agency

Year	Police	Sheriff	MHP	BIA	Total
1988	5,612	478	8,818	0	14,908
1989	1,907	483	10,463	0	12,853
1990	1,316	379	12,277	0	13,972
1991	1,658	355	12,269	15	14,297
1992	3,611	453	12,283	62	16,409
1993	2,799	474	9,192	106	12,571
1994	3,654	546	10,443	70	14,713
1995	3,173	585	11,981	38	15,777
1996	2,784	816	8,053	5	11,658
1997	2,798	567	9,289	11	12,665
1998	1,911	459	13,285	75	15,730
1999	4,451	521	13,454	32	18,458
2000	3,022	792	11,324	30	15,168
2001	2,136	783	9,442	9	12,370
2002	3,660	698	7,991	11	12,360
2003	2,328	696	12,794	2	15,820
Chg 1 Year	-36.4%	-0.3%	+60.1%	-81.8%	+28.0%
Chg 5 Year	-23.3%	+7.0%	+15.3%	-93.6%	+6.8%

Source: TIS – Montana Department of Transportation

The number of convictions resulting from citations written by sheriff departments decreased very slightly during 2003. However, over 90% of these convictions were from just two jurisdictions (Silver Bow and Missoula Counties). The Montana Highway Patrol citations, resulting in convictions were higher than during 2002 and higher than any year since 1999. At the same time convictions resulting from Police Department tickets were down significantly. Figure 15 on the next page shows convictions during the sixteen years of the law.

Figure 15


Seat Belt Convictions
Convictions
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1988
1990
1992
1994
1996
1998
2000
2002
Year
Sheriff
Police
MHP

Restraint usage acquired from crash reports is analyzed next. Usage as reported by the investigating officer, is quite accurate in the case of fatalities. Even if the person is no longer in the vehicle, physical evidence makes it easy to correctly code this information. For persons injured in crashes, accurate coding of this field becomes more difficult. Generally, the investigating officer must rely on the honesty of the occupants when acquiring this data. Since there is a law requiring the use of belts, some occupants will report using belts even though they didn't. Occupants with minor injuries actually report usage above the state average, which is not correct because of this inflation of reported use. The following table displays restraint use for occupant fatalities. Restraint usage is much lower for fatalities than for the overall population. There are thought to be two reasons for this. The first is that people that drive in a manner that tends to result in fatalities, are often under the influence of alcohol and/or drugs, are speeding or are involved in other hazardous driving. It has been shown in surveys that these people tend to use restraints much less often—risk takers tend to be risk takers in many life choices. The second factor is that the occupants in crashes without belts are much more likely to die than those occupants wearing belts.

Table 28
Restraint Use for Occupant Fatalities in Crashes

Year	Not Belted	Belted	Total Occupants	Percent Belted
1996	130	45	175	25.7%
1997	178	59	237	24.9%
1998	153	56	209	26.8%
1999	156	39	195	20.0%
2000	144	60	204	29.4%
2001	153	56	209	26.8%
2002	176	54	230	23.5%
2003	167	65	232	28.0%
Chg 1 Year	-5.1%	+20.4%	+0.9%	+19.1%
Chg 5 Year	+6.8%	+22.6%	+10.8%	+10.7%

Source: TIS - Montana Department of Transportation

Note that the total fatalities shown in this table is not the same as in other tables throughout this paper. This table only shows occupant fatalities and does not include, motorcyclists, pedestrians and bicyclists.

The next table shows similar data for injured occupants in crashes. The usage in this table is much higher than that reported in the fatality table. This is due to three things: 1) occupants in injury crashes are not as likely to be involved in speeding, driving under the influence and hazardous driving actions and also tend to wear restraints more often, 2) Some of these occupants are not telling the truth about restraint usage and 3) survivors often survive simply because they were belted. Occupant usage for uninjured occupants is even higher and is usually above the observed statewide usage.

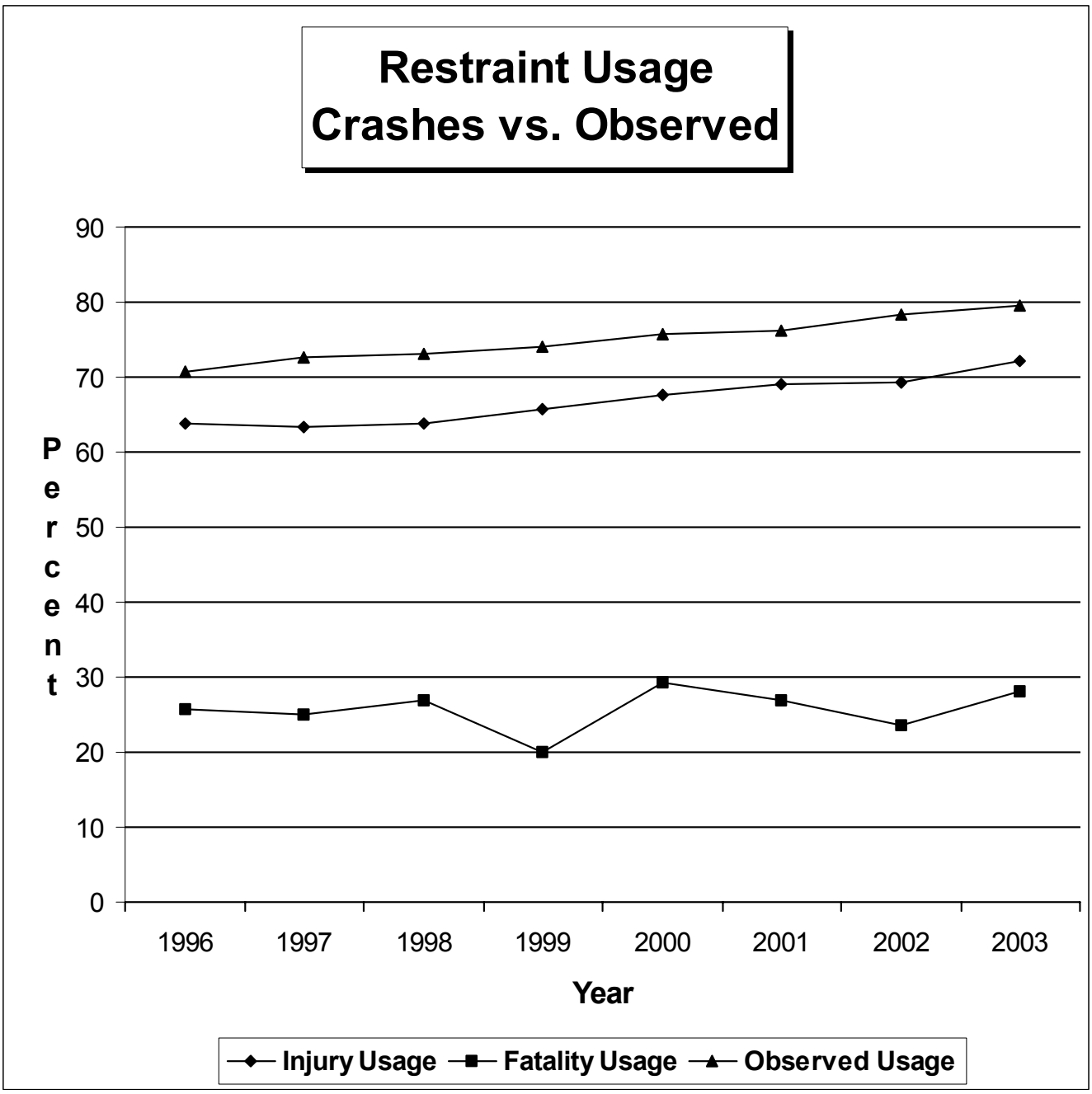
Table 29
Restraint Use for Occupant Injuries in Crashes

Year	Not Belted	Belted	Total Occupants	Percent Belted
1996	3,202	5,628	8,830	63.7%
1997	3,164	5,449	8,613	63.3%
1998	2,954	5,195	8,149	63.8%
1999	2,899	5,566	8,465	65.8%
2000	2,814	5,910	8,724	67.7%
2001	2,203	4,929	7,132	69.1%
2002	2,462	5,561	8,023	69.3%
2003	2,182	5,651	7,833	72.1%
Chg 1 Year	-11.4%	+1.6%	-2.4%	+4.0%
Chg 5 Year	-18.2%	+4.0%	-3.3%	+7.4%

Source: TIS - Montana Department of Transportation

This usage has been increasing during this period of time represented in this chart. The amount of increase seems to be similar to the state usage survey increases. Figure 16 on the following page shows usage from the previous two tables along with annual observed usage in Montana.

Figure 16


Restraint Usage
Crashes vs. Observed
90
80
70
60
50
40
30
20
10
0
Percent
1996
1997
1998
1999
2000
2001
2002
2003
Year
Injury Usage
Fatality Usage
Observed Usage

Fatalities and injuries to vehicle occupants ages four and under are of interest in relation to child safety and child restraint usage. The following table displays the history of injury data over the last twenty-two years. Injuries generally increased from 1990 to 1999, but decreased in 2000 and 2001, with a slight upturn during 2002 and 2003. During the early 1970's, the fatalities for this age group were usually between ten and fifteen. When child restraints became more common, these numbers dropped. Rental programs and publicity during the eighties helped reduce injuries to a level of 154 in 1991.

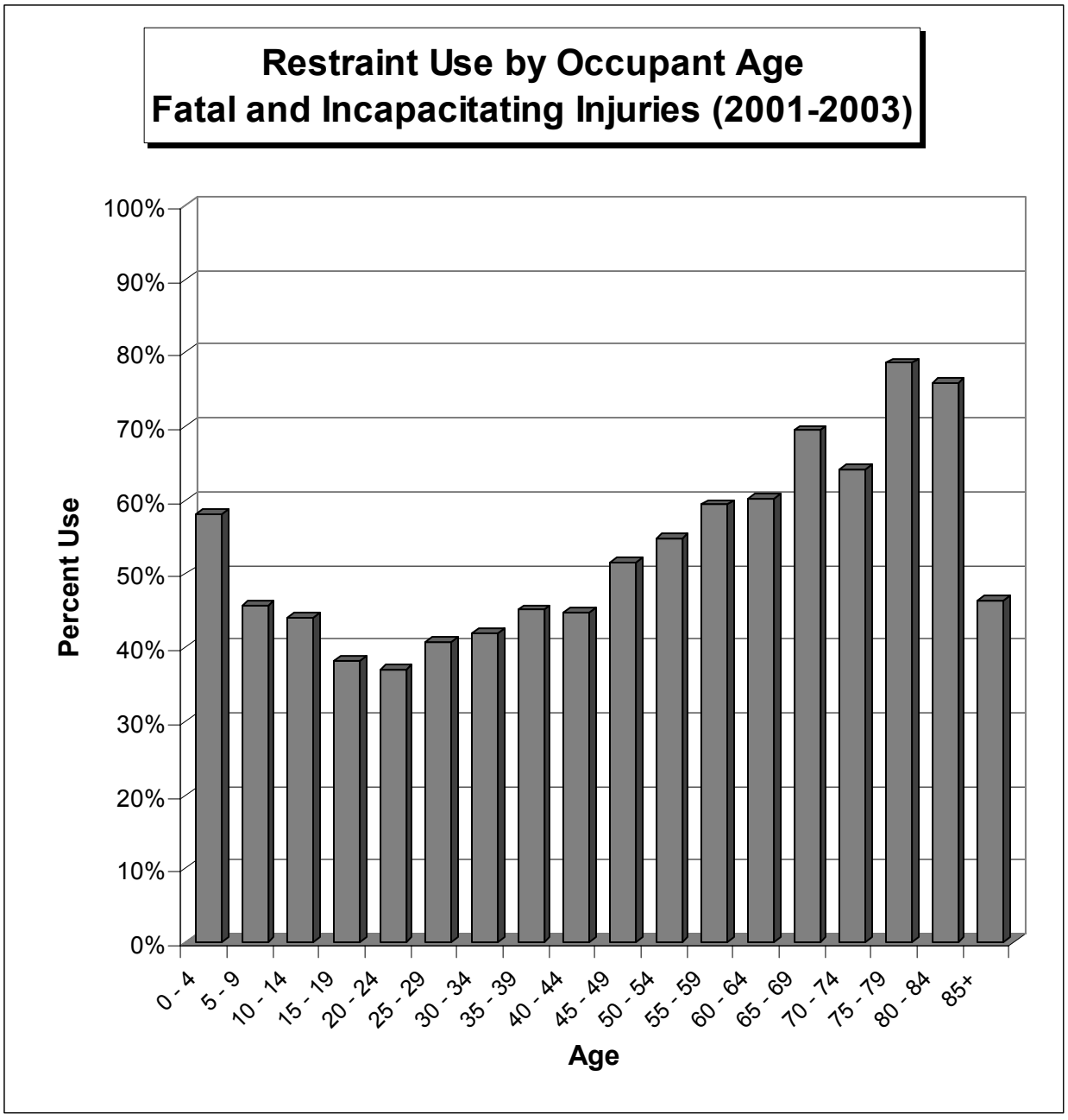
Table 30
Occupant Injuries – Age Four and Under

Year	Fatalities	Injuries
1982	3	220
1983	3	215
1984	1	198
1985	2	178
1986	5	161
1987	4	196
1988	5	164
1989	5	174
1990	2	159
1991	4	154
1992	3	160
1993	0	166
1994	6	188
1995	3	170
1996	6	209
1997	6	228
1998	3	283
1999	1	288
2000	4	249
2001	1	216
2002	1	226
2003	4	232
Change 1 Year	+300.0%	+2.7%
Change 5 Year	+100.0%	-8.1%

Source: Montana Department of Transportation

Restraint usage by age cannot be determined from the observational survey. We can analyze belt use data in crashes and acquire a general idea of how usage in Montana varies by age. In order to show significance, the last three years of crash information was analyzed (2001 – 2003). Usage is shown on the following page in Figure 17.

Figure 17


Restraint Use by Occupant Age
Fatal and Incapacitating Injuries (2001-2003)
Percent Use
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 - 4
5 - 9
10 - 14
15 - 19
20 - 24
25 - 29
30 - 34
35 - 39
40 - 44
45 - 49
50 - 54
55 - 59
60 - 64
65 - 69
70 - 74
75 - 79
80 - 84
85+
Age

3. Hazardous Actions, Speed and License Compliance

a. Speed and Driver Contributing Circumstances

The 1999 legislature passed a speed limit bill that became law on Memorial Day weekend of 1999. The limit on the interstate for passenger vehicles was set at 75, while the limit on most other non-interstate routes was set at 70 mile per hour. Night speeds are 75 on the interstate and 65 on non-interstate routes. Trucks have limits that are slower on some roads. During the past four full years, fatalities have averaged over 249. The four years previous to the speed change, fatalities averaged 229. This does not really make sense, since fatalities were lower during the "basic rule" years with no specific limit than now with a specific numeric speed limit.

When the national speed limit was rescinded December 8, 1995, Montana no longer had a specific daytime speed limit. The Montana "basic rule" law required that vehicles be driven "… in a careful and prudent manner and at a rate of speed no greater than is reasonable and proper under the conditions existing at the point of operation…". During the years of the basic rule, drivers from out- of-state drove significantly faster than Montanans. Certainly the1999 speed limit legislation solved this issue with out-of-state drivers. Montanans, through experience, usually understood that there was a speed limit, which just didn't have a specific number attached, while out of state drivers did not understand this.

Characteristics recorded about the driver and his or her actions leading up to crashes are now examined. The most common contributing circumstances in crashes, as determined by the investigating officer, are summarized in Table 31. Careless Driving has been generally higher over the last few years. During 1994, crash investigators felt that careless driving was one of the contributors to the crash in 3,813 instances. During each of the last five years, this was felt to be a contributor in over 5,300 instances. This trend requires continued observation and may be tied in with the change in speed limits. The other contributors do not seem to be showing significant trends.

Inattentive Driving is the major contributing circumstance in crashes. It was a contributor with 7,380 of the drivers in crashes. The other contributing circumstances are direct driving actions during driving or the use of alcohol and/or drugs. Inattentive driving is an overall category for not concentrating on the task of driving and is very subjective by the investigating officer. It does seem to be increasing in Montana, as drivers are often not concentrating on driving. It is apparent that drivers are doing other things in their car besides driving, such as eating, smoking, talking on cell phones, adjusting controls, inserting tapes or CD's, looking at GPS mapping, and many other activities. There are more possible distractions in our busy electronic world and many of these seem to be taking a priority over actually operating the car. Cell phone use was admitted to as a contributor in 62 crashes and was likely a distraction in many more.

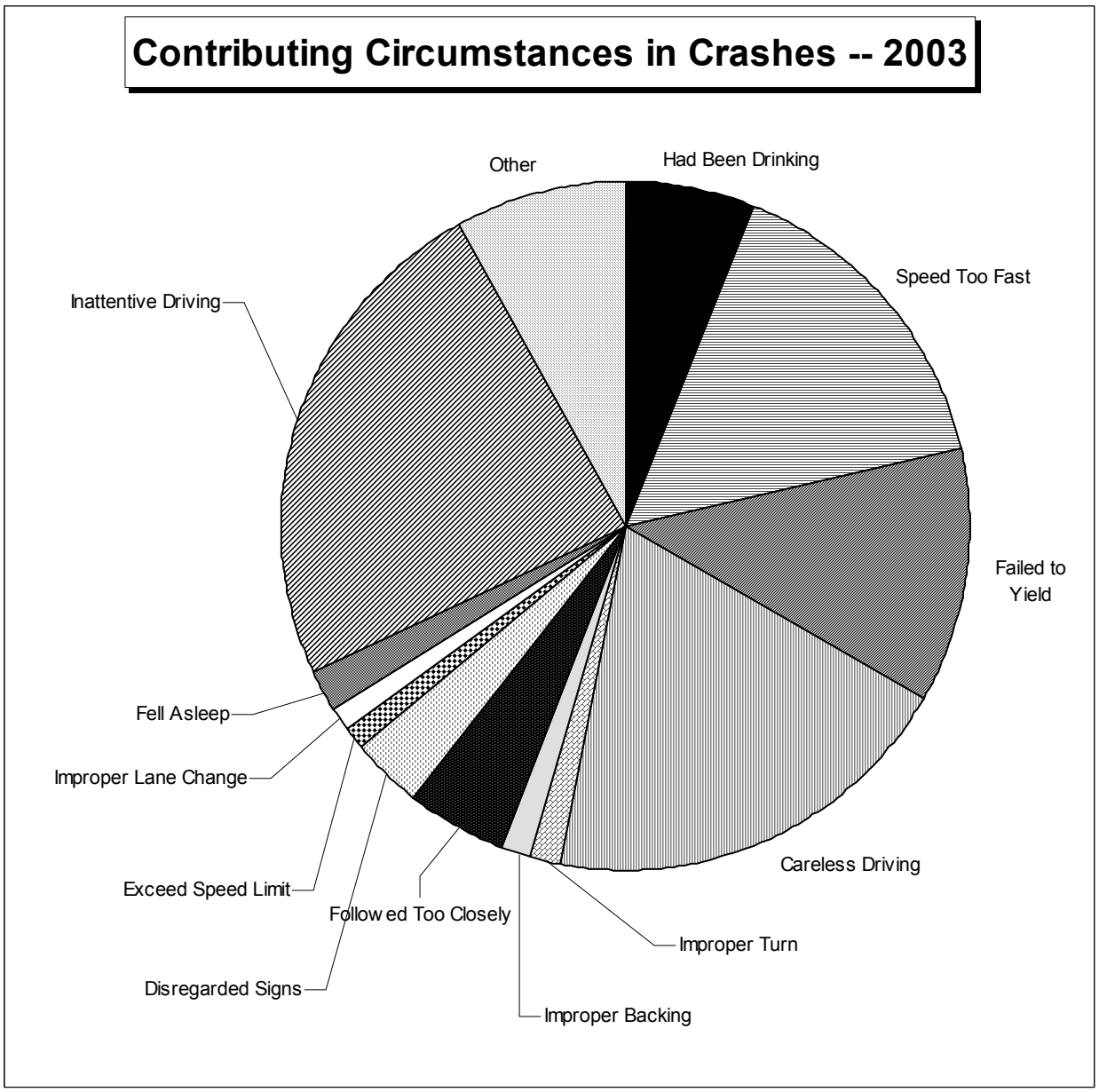
Table 31
Contributing Circumstances in Crashes

Year	Alcohol	Speed Too Fast	Failed to Yield	Careless Driving	Follow Too Closely	Improper Turn	Improper Backing
1994	1,382	2,883	3,664	3,813	---	530	487
1995	1,532	2,887	3,902	4,133	---	531	493
1996	1,948	6,146	4,480	3,924	1,328	893	797
1997	1,791	4,806	4,040	4,313	1,397	865	710
1998	1,816	4,462	3,687	4,645	1,284	753	718
1999	1,851	3,335	3,483	5,492	1,338	713	633
2000	1,818	4,396	3,627	5,928	1,341	742	629
2001	1,708	3,426	3,690	5,373	1,385	500	465
2002	1,922	4,517	3,883	5,890	1,517	503	459
2003	1,889	4,663	3,695	5,998	1,400	501	400
Chg 1 Yr	-1.7%	+3.2%	-4.8%	+1.8%	-7.7%	-0.4%	-12.9%
Chg 5 Yr	+3.6%	+15.8%	+0.6%	+9.7%	+2.0%	-22.0%	-31.1%

Source: TIS – Montana Department of Transportation

The loss of a numerical speed limit in 1995 along with a new crash reporting form in 1996 affected the category of hazardous actions. Some categories were modified, while others were added. These changes affected the counts in some categories. Speed too fast for conditions increased sharply in 1996. Of the 4,663 circumstances where speed was too fast for conditions during 2003, the interstate accounted for 1,101. US routes had 666 occurrences, while state routes had another 1,108. There were 1,154 incidents on county roads. Figure 18 on the following page shows a percentage breakout for driver's hazardous actions in crashes for 2003.

Figure 18


Contributing Circumstances in Crashes -- 2003
Other
Had Been Drinking
Speed Too Fast
Inattentive Driving
Failed to Yield
Fell Asleep
Improper Lane Change
Careless Driving
Exceed Speed Limit
Followed Too Closely
Improper Turn
Disregarded Signs
Improper Backing

b. Driver's License Compliance:

The next table examines the license status of each driver at the time of involvement in an injury or fatality crash. Only the most common status codes are included in the table. The addition of a short crash reporting form, which doesn't capture status of license has complicated this table. Since short forms are used on some Property Damage Only crashes, this table excludes all property damage crashes and examines injury crashes only to assure data consistency over the ten year period.

Table 32
License Status for Drivers in Injury Crashes
(Injury crashes only)

Year	Valid License	No License	Proba-tionary	Expired	Suspended	Revoked
1994	9,680	---	47	130	137	122
1995	10,044	---	57	142	152	132
1996	11,292	341	59	135	156	148
1997	10,787	360	46	160	219	122
1998	9,883	333	52	151	213	120
1999	9,984	320	51	155	289	150
2000	10,570	320	63	102	280	145
2001	8,908	299	49	75	239	119
2002	9,784	314	49	88	294	112
2003	9,263	296	40	78	304	114
Chg 1 Yr	-5.3%	-5.7%	-18.4%	-11.4%	+3.4%	+1.8%
Chg 5 Yr	-5.7%	-6.7%	-24.2%	-31.7%	+15.6%	-11.8%

Source: TIS – Montana Department of Transportation

Drivers involved in crashes while driving with a suspended license have increased significantly in the last ten years. During 1994 there were 137 of these occurrences and this count reached 304 in 2003. Drivers with no license during a crash are decreasing slightly.

4. Traffic Records

Traffic safety data and specifically crash data are an important part of any highway safety program. Without timely and relevant data, a traffic safety program cannot efficiently operate. Countermeasures cannot be developed without the ability to determine where problem areas occur. NHTSA requires the Highway Safety Plan to be data driven, so good data systems are required.

The current crash system and reporting form were developed during 1994 and 1995. This system replaced Montana's Highway Information System (HIS) on January 1, 1996. The new system is part of the overall Transportation Information System (TIS) supported by the Montana Department of Transportation. Included with this new system is an on line road log, traffic counts, and a GIS database which contains a photo log of all on system roads in the state. The crash report form was modified slightly on January 1, 2001 and again during 2004. In addition a new short form was added during 2001. This form can be used for property damage only crashes but may have some undesirable effects on the data. There is the possibility of overuse of the form and also use in the incorrect circumstance. This will be examined over the next few years.

During 2004, a Traffic Records Assessment was conducted for Montana. This assessment report discusses the positives and negatives of traffic records concerning highway safety in the state. Many recommendations were suggested in this report. The most important recommendation is that Montana needs to formalize a two-tiered Traffic Records Coordinating Committee across multiple agencies and jurisdictions. The State Highway Traffic Safety Office plans on leading the development of a Strategic Plan for Traffic Records. Once this plan is in place, NHTSA funds may be made available to Montana for improving Traffic Records systems within the state.

Computers have been installed in enforcement vehicles over the last several years. Several local law enforcement jurisdictions currently have laptops mounted in their cars. Traffic Safety contracted with the Highway Patrol to develop a software system for input of crash data of reportable crashes at the scene. Quest Inc. was subcontracted to develop the system. This software was completed and is being used by Highway Patrolmen in their offices and a large percentage of officers in Police and Sheriff Departments. It is used on either in-car computers or computers within the office. Currently, forms are being completed in the office and transmitted to Highway Patrol headquarters as computer generated paper forms and then added to the database. The Patrol is working on modifying the software to accept forms in electronic format.

The Department of Transportation is examining the possibility to allow entry of location codes by GPS. Then the department will transform those locations onto X-Y coordinates and attach the crashes to the road system.

A DUI tracking system or a citation/conviction tracking system would be advantageous to traffic safety within Montana. At present there is no method to track citations from date of issue, to and through the courts and adjudication, then on the Department of

Justice Driver Records system. There exists no process to acquire data such as average BAC on DUI's or location of citations. A tracking system could allow for the summarization of citations of all types along with specifics about the citations. This could then be utilized by enforcement, traffic safety, the court system and the Department of Justice. This is one of the primary recommendations of the traffic records assessment. The challenges with developing a system like this in Montana are currently many. This would require an effort across several agencies including the Department of Justice, Court Administration, Local Law Enforcement agencies and the Department of Transportation. Some of these agencies have other data processing problems that they feel are more important to update at this time.

The state does not have the funding required to develop this system. The formation of a working Traffic Records Coordinating Committee and the development of a Traffic Records Strategic Plan could provide the desire and a portion of the required funding, for development.

5. Emergency Medical Services

Emergency Medical Services differs from many program areas that are related to Traffic Safety because there is no intention of affecting the number of crash occurrences. Theoretically, better EMS will reduce the number of fatalities and complications from severe injuries. Table 33 lists the total number of crashes involving either fatalities or incapacitating injuries by county. This provides a basis for approximating the need of EMS as related to traffic crashes in each county.

Table 33
Severe Injury Crashes by County – 2003

County	Severe Crashes	County	Severe Crashes
Beaverhead	22	McCone	3
Big Horn	21	Meagher	6
Blaine	8	Mineral	16
Broadwater	9	Missoula	205
Carbon	24	Musselshell	6
Carter	6	Park	26
Cascade	67	Petroleum	2
Chouteau	11	Phillips	9
Custer	10	Pondera	11
Daniels	3	Powder River	8
Dawson	9	Powell	29
Deer Lodge	18	Prairie	3
Fallon	2	Ravalli	71
Fergus	22	Richland	17
Flathead	113	Roosevelt	19
Gallatin	71	Rosebud	12
Garfield	4	Sanders	30
Glacier	39	Sheridan	3
Golden Valley	4	Silver Bow	32
Granite	13	Stillwater	22
Hill	19	Sweet Grass	14
Jefferson	28	Teton	9
Judith Basin	6	Toole	7
Lake	61	Treasure	2
Lewis and Clark	56	Valley	11
Liberty	2	Wheatland	5
Lincoln	51	Wibaux	1
Madison	13	Yellowstone	137

Source: TIS – Montana Department of Transportation

The county with the most severe crashes in Montana was Missoula with 205. Yellowstone County was next with 137 severe crashes followed by Flathead County with 113. Following, these three counties, there is a significant drop in numbers to Ravalli and Gallatin with 71 and Cascade with 67.

The EMS and Injury Prevention Section is moving forward in the development and/or acquisition and implementation of a new Trauma Records database and a new statewide Trip Reports database. The first system will allow for a comprehensive trauma database, which may be able to tie into CODES applications. This second system will allow the tracking of detailed information of many variables concerning ambulance runs including data related to treatment and procedures given to patients, quality control and response times.

Computers exist in most of the ambulance services in the state. The services use these computers for training. In addition, the computers will be used for entry of ambulance trip report data. A subset of this data will be transferred to the state EMS Bureau for statewide informational purposes.

6. Young Drivers and Senior Drivers

This section examines the age of the drivers that are involved in traffic crashes. Crash rates per one thousand licensed drivers are calculated. This data provides additional information to allow for better decisions on targeting specific high-risk age groups. Table 34 contains this age related data.

Table 34
Crashes by Age of Driver
(2003 Crash Data)

Age	Licensed Drivers (2003)	Drivers in Crashes	Crashes per 1000 Licenses	Drivers in Fatal Crashes	Fatal Crashes per 1000 Licenses
Under 16	4,897	922	188	11	2.25
16	8,979	1,294	144	10	1.11
17	10,981	1,496	136	6	0.55
18	12,059	1,438	119	13	1.08
19	12,897	1,295	100	8	0.62
20	12,821	1,106	86	9	0.70
Under 21	62,634	7,551	121	57	0.91
21-24	47,804	3,831	80	36	0.75
25-29	57,076	3,160	55	31	0.54
30-39	111,301	5,359	48	44	0.40
40-49	146,406	5,991	41	65	0.44
50-59	128,235	4,410	34	46	0.36
60-69	79,139	2,223	28	24	0.30
70+	71,914	2,143	30	31	0.43

Source: TIS – Montana Department of Transportation
Motor Vehicle Division – Department of Justice

Young drivers are over-represented in traffic crashes based upon the number of licensed drivers. Nationally the number of miles driven by teens is less than for drivers of all ages. In fact teens drive 35% fewer miles than average adults. If teen drivers in Montana are similar to the teens across America, then their rate of crashes per vehicle miles driven would be even more extreme than the rate per licensed driver shown above. Drivers between 15 and 20 years of age were involved in 121 crashes per thousand drivers during 2003. Every other age group over 20 years of age had a rate

of 80 or less crashes per thousand licensed drivers. Each higher age group had fewer crashes per licensed driver than the previous age group, with the exception of the over 70 group. The data suggests that inexperience and/or risk-taking are factors in crash risk for youth. Certainly the change for each year of age between 15 and 20 supports the supposition that experience is a strong factor. It is of interest to note that a 15 year-old driver is nearly 7 times more likely to be in a crash than a driver in their sixties.

Similarly, the fatal crash rate is lower for older drivers. Drivers under 21 were involved in .91 fatalities per thousand licensed drivers. All age groups above 25 were involved at a rate of 0.54 or less fatalities per thousand drivers. The drivers over 70 were involved in a higher rate of fatal crashes than three other age groups. Considering that they driver fewer vehicle miles than other age groups this risk is even greater on a per mile basis. The following chart shown in Figure 19 shows this change in crash incidence by age of driver.

Figure 19

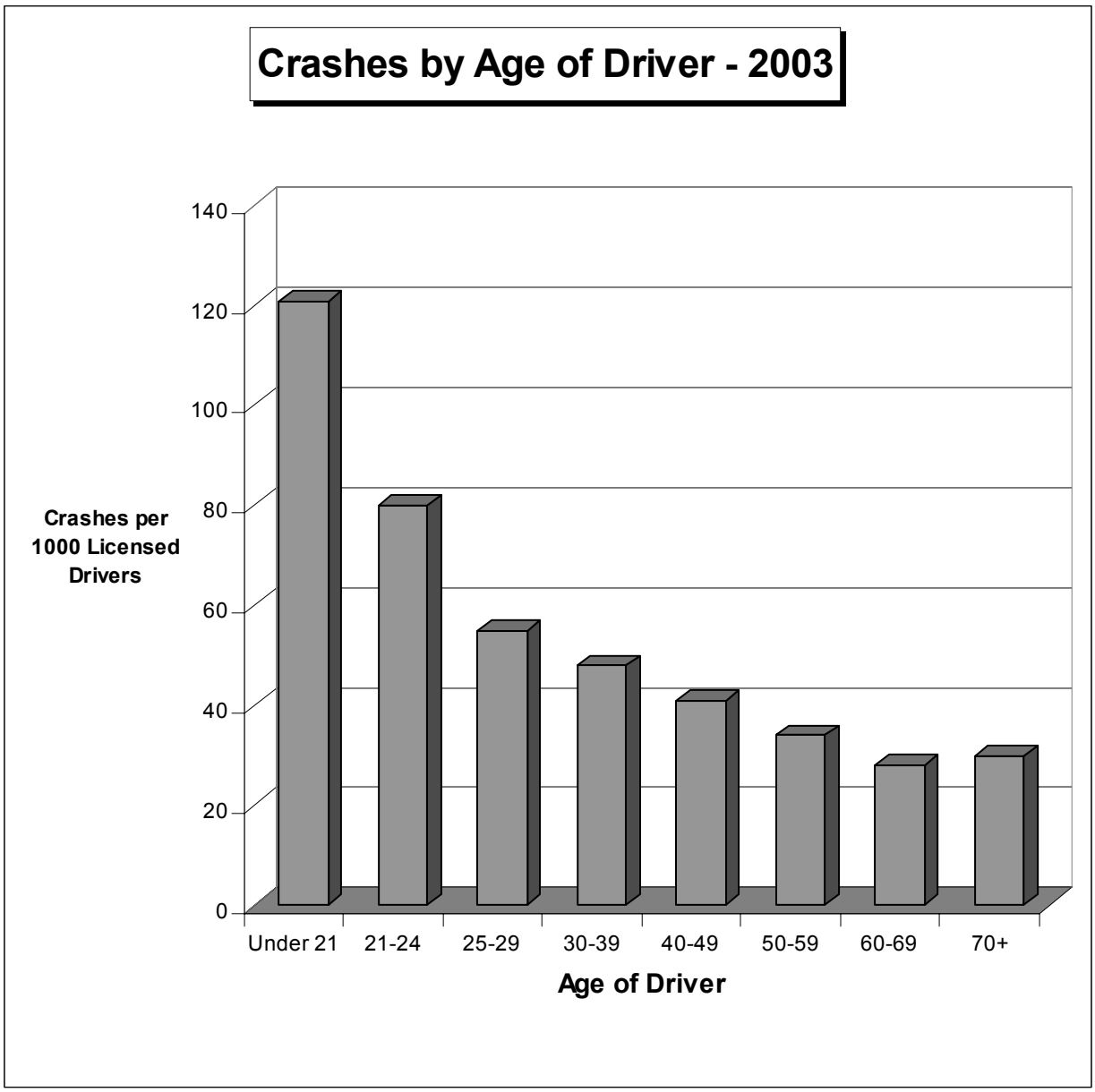

Crashes by Age of Driver - 2003
Crashes per 1000 Licensed Drivers
140
120
100
80
60
40
20
0
Under 21
21-24
25-29
30-39
40-49
50-59
60-69
70+
Age of Driver

Table 35 displays elderly drivers and young drivers involved in crashes as a percentage of all drivers in crashes. The data is presented for the last ten years and includes 1984 and 1988 in order to display long-term trends.

Table 35
Drivers in Crashes
Elderly and Youthful

	Percent of Drivers In Crashes Under Age		Percent of Drivers in Crashes of this Age or Older		
Year	18	21	55	65	75
1984	10.5%	23.8%	13.2%	6.8%	2.3%
1988	11.9%	23.7%	15.2%	8.6%	3.1%
1994	12.3%	23.2%	15.5%	9.0%	3.9%
1995	12.7%	23.9%	15.4%	8.9%	3.6%
1996	11.1%	22.0%	15.5%	8.7%	3.5%
1997	12.0%	23.0%	16.1%	9.0%	4.0%
1998	11.9%	23.3%	16.3%	9.0%	3.9%
1999	12.6%	24.3%	16.6%	9.1%	4.1%
2000	12.1%	24.0%	16.6%	8.7%	3.9%
2001	12.1%	24.1%	16.9%	8.8%	4.0%
2002	11.3%	23.0%	17.1%	8.8%	3.8%
2003	10.7%	21.8%	18.0%	8.8%	3.9%
Chg 1 Year	-5.3%	-5.2%	+5.3%	---	+2.6%
Chg 5 Year	-10.8%	-8.2%	+7.8%	-0.9%	-1.0%

Source: TIS - Montana Department of Transportation

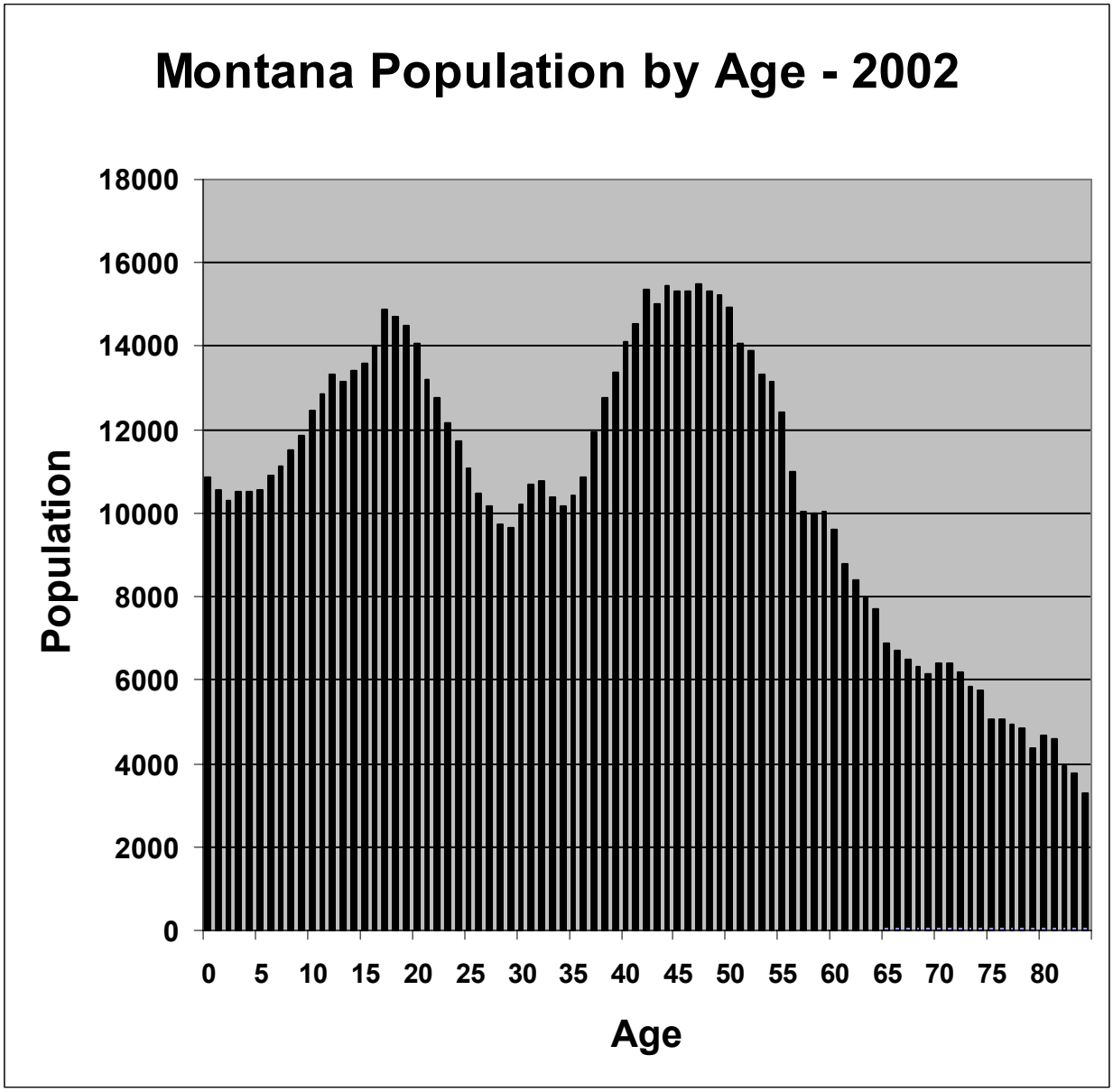
The percentage of crashes involving young drivers has not changed significantly during the last nineteen years. Elderly drivers have experienced increases during this period. People are living longer and older drivers now make up a larger percentage of licensed drivers in Montana. During 1984, only 2.3% of drivers involved in crashes were 75 and over. This percentage during 2003 was up to 3.9%. Similarly, those drivers 65 and over have changed from 6.8% to 8.8%. Drivers 55 and over have increased from 13.2% to 18.0%.

In order to envision the challenges before Montana's citizens in the traffic safety area, the population by age estimate for 2002 is next presented in Figure 20 on the following page. During 2002, the baby boom population in Montana seemed to span the age group from 38-55. There is a second boom in Montana from age 10-23. The variation in population for some ages is quite significant. It should be noted that there are more than 14,000 Montana citizens for each of the ages sixteen to twenty and forty to fifty; but there are less than 10,000 twenty-eight and twenty-nine year olds.

What does this mean to traffic safety? Over the next fifteen years there will be steady growth in the number of drivers over 60 years of age. This will become a significant concern of the traffic safety community as the number of older drivers increases. Currently, and over the next few years, we are in the midst of a large number of teen and young adult drivers. This is the highest risk group in traffic safety. So the number of elderly drivers and the number of drivers under 30 is increasing while the group of drivers between 30 and 55 will be decreasing.

These population figures are being noted because of the special challenges that they present to traffic safety. It will be doubly difficult in the near future to show improvement in traffic safety while the number of drivers in the high-risk age groups increases. Some rate improvements may be realized in traffic safety, but it will be much more difficult to decrease the number of incidents relating to these age groups.

Figure 20


Montana Population by Age - 2002
Population
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80
Age

7. Motorcycle Involvement in Crashes

Motorcyclists in traffic crashes comprise a relatively small percentage of all persons involved in crashes. However, these persons are at much greater risk when involved in a crash. Because of this, motorcycles account for a significant amount of fatalities and serious injuries. Table 36 examines the number of motorcycle registrations, crashes, fatal crashes and injury crashes over the past ten years.

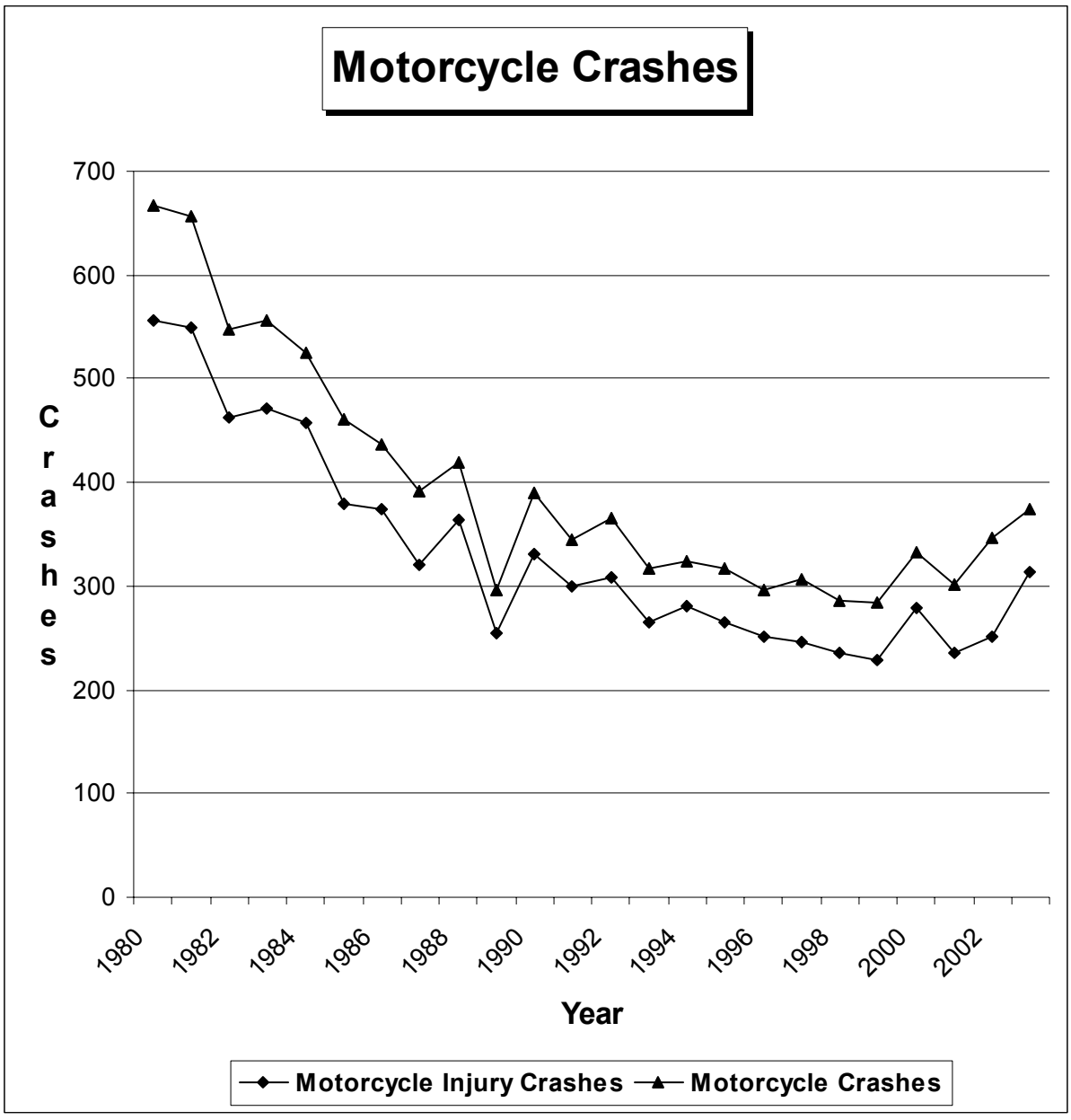
Table 36
Motorcycle Crashes

Year	Motorcycle Regist-rations	Crashes	Percent of All Crashes	Fatal Crashes	Percent of all Fatal Crashes	Injury Crashes	Percent of all Injury Crashes
1994	NA	324	1.7%	13	7.1%	281	4.3%
1995	18,225	317	1.5%	14	7.5%	265	3.9%
1996	17,935	296	1.2%	8	4.5%	252	3.6%
1997	17,978	307	1.4%	18	8.1%	246	3.5%
1998	NA	286	1.3%	13	6.3%	235	3.5%
1999	NA	284	1.3%	15	7.7%	229	3.4%
2000	NA	332	1.5%	14	7.0%	279	4.0%
2001	25,618	302	1.4%	11	5.5%	236	3.8%
2002	28,111	347	1.5%	24	10.3%	251	3.9%
2003	34,433	375	1.6%	12	4.6%	314	5.0%
Chg 1 Year	+22.5%	+8.1%	+6.7%	-50.0%	-55.3%	+25.1%	+28.2%
Chg 5 Year	---	+20.9%	+14.3%	-22.1%	-37.5%	+27.6%	+34.4%

Source: TIS – Montana Department of Transportation

Motorcycle registrations have been increasing significantly over the last few years and are nearly double the number during 1997. These registrations increased by 22.5% in just the past year. Motorcycle injury crashes increased by 25% during 2003. Motorcycle fatality crashes returned to a more average level after the very high number of fatalities in 2002. There were 360 injuries resulting from the 314 injury crashes. Figure 21 on the following page shows the trend in motorcycle crashes and injuries.

Figure 21


Motorcycle Crashes
700
600
500
400
300
200
100
0
Crashes
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year
Motorcycle Injury Crashes
Motorcycle Crashes

Helmet usage for drivers and passengers in motorcycle crashes is displayed in the following table. Usage was quite low for most ages. Those over 65 wore helmets much more often than the other age groups—during 2003 their usage was 60%. For most other age groups usage was between 35 and 45 percent.

Table 37
Motorcycle Helmet Use by Age
(2003 Crash Data)

Age	Driver		Passenger	
	Used	Not Used	Used	Not Used
14 & Under	2	1	3	0
15-17	5	2	0	4
18-19	7	13	0	5
20-24	14	27	0	6
25-34	27	39	1	10
35-64	84	132	22	16
65 & Over	9	6	0	0
Not Stated	0	7	0	0
Total	148	227	26	41

Source: TIS - Montana Department of Transportation

The observational helmet use survey estimates a 65 percent usage rate for 2003. Usage on interstates and primary routes were relatively high at 75%. City and local road usage was much lower at 46% and 47% respectively. The overall statewide usage rate is derived from only 203 observations making the precision of the estimate less desirable. This small sample size means that there is 95 percent confidence that the estimate is within 7 percentage points of the actual usage.

Differences between drivers from crashes involving a motorcycle and drivers from all crashes were investigated. When looking at the data field, “Drivers by sobriety”, the driver was coded as alcohol and/or drugs present for 5.4 percent of all crashes. The same field was coded in 11.3 percent of motorcycle-involved crashes.

For the “Drivers by License Restriction Code”, 1.6 percent of drivers in all crashes did not comply with restrictions, while 9.1% of drivers in motorcycle crashes did not comply. Pertaining to the “Drivers By License Status” field, 1.4 percent of drivers in all crashes had no license while, 2.0 percent of drivers involved in motorcycle crashes had no license. Suspended licenses accounted for 1.4% of drivers in all crashes and 3.6% in

motorcycle crashes. Those drivers that did not have a proper license for vehicle type were 0.7% in all crashes and 4.4% in motorcycle-involved crashes.

Of the motorcyclists who are in traffic crashes, 35.7% receive an incapacitating injury or are killed. In all crashes only 3.5% of the occupants receive this level of injury. The chance of severe injury is ten times higher when riding motorcycles.

In the next table, we examine the age of motorcycle fatal crash victims. Most fatalities in past decades occurred in the 20-34 year age group. However, in recent years there has been a shift occurring with most fatalities coming from over 35 years of age. A few fatalities are even occurring in the 65 and over age group, which prior to 1995 was a rarity. Fewer fatalities are occurring to motorcycle riders under age 25.

Table 38
Motorcycle Fatalities by Age

Year	Age Groups							
	0-14	15-17	18-19	20-24	25-34	35-64	65+	Total
1994	0	0	2	0	3	8	0	13
1995	0	0	1	1	4	10	0	16
1996	0	0	2	2	1	4	0	9
1997	0	1	2	2	4	11	0	20
1998	0	0	1	0	3	8	2	14
1999	0	0	0	2	3	10	0	15
2000	0	0	0	3	1	8	1	13
2001	0	0	0	2	2	6	2	12
2002	0	1	0	3	3	14	3	24
2003	0	0	0	1	2	7	2	12
10 Yr Total	0	2	8	16	26	86	10	148

Source: TIS – Montana Department of Transportation

Motorcyclist deaths continue to be a concern in the state. Severe injuries have a large impact because of the medical costs and continuing care costs to the public and private sectors.

8. Collisions with Pedestrians

A general summary of pedestrian collisions is displayed below in Table 39. Pedestrian crashes account for 6.1% of all fatal crashes, but less than one percent of all crashes.

Table 39
Motor Vehicle Collisions with Pedestrians

Year	Crashes	% of All Crashes	Fatal Crashes	% of all Fatal Crashes	Fatalities	Injury Crashes	Injuries
1994	169	0.9%	11	6.0%	11	155	170
1995	185	0.9%	12	6.5%	12	171	196
1996	180	0.7%	13	7.3%	13	149	178
1997	167	0.7%	9	4.0%	9	136	146
1998	166	0.8%	13	6.3%	13	135	148
1999	153	0.7%	7	3.1%	7	128	139
2000	161	0.7%	11	5.5%	11	139	148
2001	167	0.8%	9	4.5%	9	141	163
2002	174	0.7%	14	6.0%	14	152	164
2003	163	0.7%	10	6.1%	10	138	158
Chg 1 Year	-6.3%	---	-28.6%	+1.7%	-28.6%	-9.2%	-3.7%
Chg 5 Year	-0.7%	-5.4%	-7.4%	+20.1%	-7.4%	-0.7%	+3.7%

Source: TIS – Montana Department of Transportation

Pedestrian crashes, which occur outside of city limits, are less common than urban crashes. However, rural crashes tend to have a higher percentage of fatal and severe injury crashes. During the last ten years, less than 23% of pedestrian crashes were rural. At the same time, more than 50% of the fatal crashes were rural. About five fatalities and forty-two injuries occur during an average year on rural roads.

Table 40
Rural Motor Vehicle Collisions with Pedestrians

Year	Rural Crashes	% of All Pedest. Crashes	Rural Fatal Crashes	% of all Pedest.. Fatal Crashes	Rural Fatalities	Rural Injury Crashes	Rural Injuries
1994	35	20.7%	8	72.7%	8	27	36
1995	34	18.4%	2	16.7%	2	32	37
1996	50	27.8%	8	61.5%	8	40	55
1997	50	29.9%	6	66.7%	6	42	49
1998	42	25.3%	6	46.2%	6	35	40
1999	26	17.0%	5	71.4%	5	20	24
2000	40	24.8%	7	63.6%	7	32	54
2001	29	17.4%	4	44.4%	4	23	36
2002	41	23.6%	5	35.7%	5	35	44
2003	33	20.2%	3	30.0%	3	30	45
Ave	38.0	22.5%	5.4	50.9%	5.4	31.6	42.0

Source: TIS – Montana Department of Transportation

Table 41 lists the pedestrian injuries plus fatalities by age. Casualties tend to be spread among all ages, but there is some concentration of injuries from ages 5 to 24. Injuries from pedestrians makes up a small percentage of total injuries in the state, but the number of pedestrian fatalities still makes up a significant amount of the total number of fatalities. Injuries seem to be on the increase for pedestrians from 35 to 64 years of age.

Table 41
Pedestrian Casualties by Age

Year	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1994	9	44	37	24	20	15	4	15	181
1995	11	58	37	17	18	17	7	23	208
1996	3	38	30	28	23	15	7	27	191
1997	8	32	33	11	20	13	13	19	155
1998	2	28	38	13	24	17	10	20	161
1999	4	28	17	7	11	14	8	34	146
2000	5	41	27	18	20	20	11	17	159
2001	4	37	32	15	21	18	17	15	172
2002	4	37	47	21	18	26	11	14	178
2003	1	23	34	19	27	21	14	15	168
10 Yr Total	51	366	332	173	202	176	102	199	1,719

Note: The totals for each year may not equal the total because of a small amount of cases where no age was noted on the crash report.

Source: TIS – Montana Department of Transportation

Table 42 includes a summary of actions of the pedestrian during and before the time of the collision. Coding changes to the categories on the new crash reporting form beginning in 1996 may affect the numbers at that time in some categories. The action, not crossing the roadway at a crosswalk or intersection, increased over the last two years.

Table 42
Pedestrian Injuries by Action

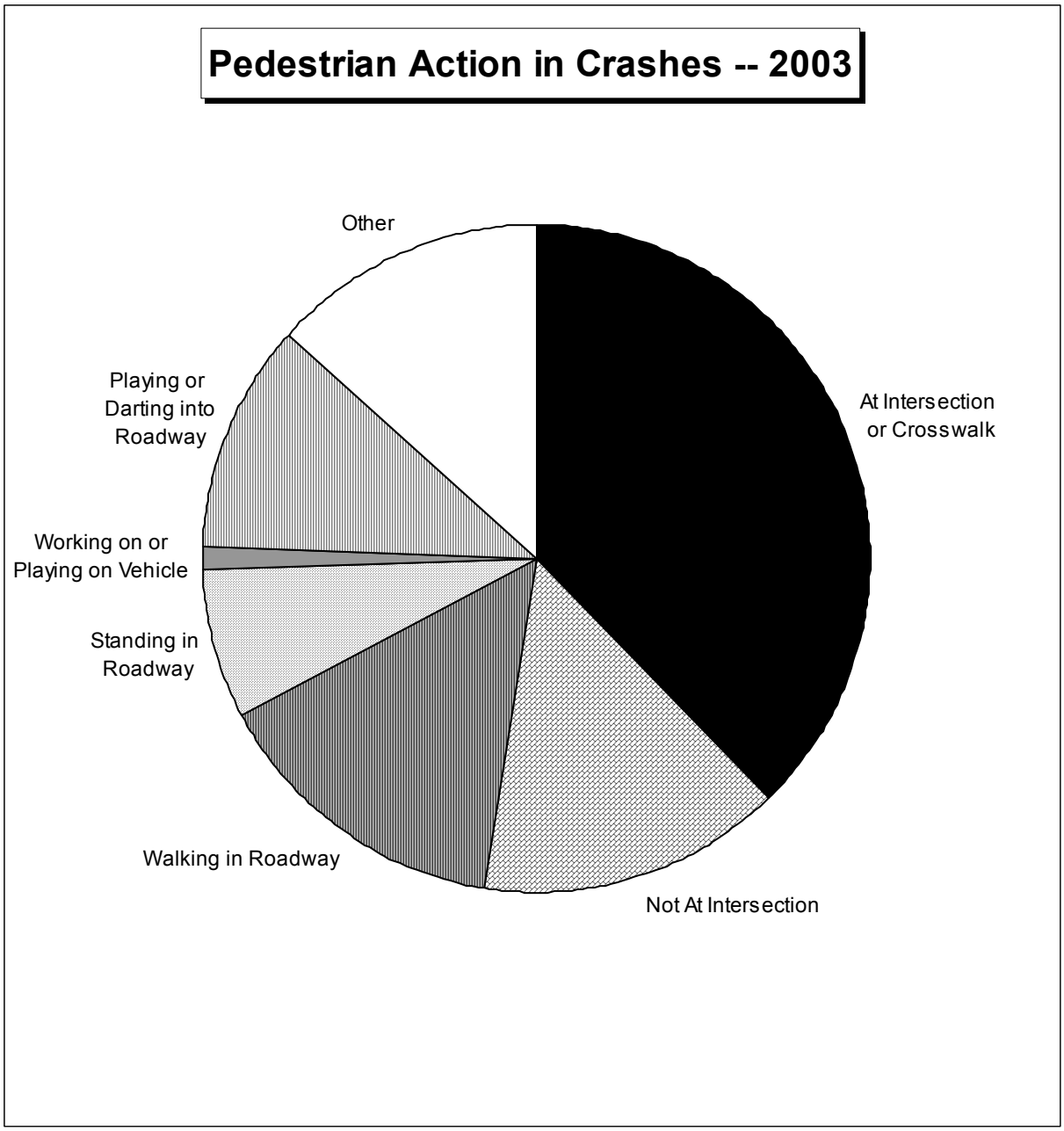
Year	At Intersection or Crosswalk	Not at Intersection or Crosswalk	Walking or Standing In Road	Working on or Pushing Vehicle	Playing or darting into Roadway	Other
1994	80	41	20	3	4	28
1995	93	42	19	5	9	24
1996	47	32	24	6	25	37
1997	35	24	29	5	24	32
1998	56	18	28	7	19	25
1999	60	12	13	3	26	23
2000	57	17	20	6	32	26
2001	58	22	24	8	27	18
2002	51	30	27	4	27	38
2003	59	23	34	2	17	21
Chg 1 Yr	+15.7%	-23.3%	+25.9%	-50.0%	-37.0%	-44.7%
Chg 5 Yr	+4.6%	+16.2%	+51.8%	-64.3%	-35.1%	-19.2%

Source: TIS – Montana Department of Transportation

* The data from 1996-2003 does not compare well with data before 1996 because of changes in crash reporting form

Figure 22 on the following page shows a pie chart for all pedestrian collisions by action during 2003. Pedestrians at an intersection or crosswalk make up the largest group occurring in over 37% of the instances.

Figure 22


Pedestrian Action in Crashes -- 2003
Other
Playing or Darting into Roadway
Working on or Playing on Vehicle
Standing in Roadway
Walking in Roadway
At Intersection or Crosswalk
Not At Intersection

9. Collisions with Bicyclists

Bicycle crashes with motor vehicles, as a percentage of total motor vehicle crashes, were lower in both 2002 and 2003 than at any time since at least 1986. The count of bicycle involved total crashes was lower than any time since 1993. The large number of fatal crashes (8) involving a bicyclist in 2000 appears to have been a very unusual statistical aberration. Only three bicycle related fatalities occurred during the last three years. The summary data is presented in Table 43.

Table 43
Motor Vehicle Collisions with Bicyclists

Year	Crashes	Percent of All Crashes	Fatalities	Percent of all Fatalities	Injuries
1994	208	1.07%	2	1.10%	203
1995	197	0.96%	1	0.47%	203
1996	180	0.74%	2	1.13%	158
1997	224	0.99%	1	0.38%	202
1998	198	0.90%	1	0.42%	183
1999	178	0.84%	3	1.36%	183
2000	200	0.90%	8	3.40%	177
2001	177	0.81%	0	0.00%	163
2002	172	0.73%	1	0.37%	158
2003	170	0.73%	2	0.76%	153
Chg 1 Year	-1.2%	---	+100.0%	+105.4%	-3.2%
Chg 5 Year	-8.1%	-12.7%	-23.1%	-31.5%	-12.0%

Source: TIS – Montana Department of Transportation

Table 44 presents bicyclist casualties (fatalities + injuries) by age. Bicyclist injuries tend to be concentrated in the ages from 5 to 19. The 10-14 year old age group remains the highest casualty group, but seems to be declining. In recent years, the injuries suffered by the age group from zero to nine (0-9) have decreased. The injuries during 2003 were less than any previous year. While the trend is definitely down, the low number during 2003 is probably somewhat of a statistical aberration. The age group ranging from 35 to 54 has increased in casualties during recent years. Total bicycle injuries were lower during 2003 than in the ten previous years.

Table 44
Bicyclist Casualties by Age

Year	0-9	10-14	15-19	20-24	25-34	35-54	55+	Total
1994	45	59	34	16	23	18	4	204
1995	41	67	30	19	20	23	4	204
1996	29	48	25	17	17	21	2	160
1997	38	62	33	19	19	24	6	202
1998	28	50	14	18	28	33	12	184
1999	28	36	23	14	13	26	8	167
2000	30	46	27	18	23	30	11	185
2001	28	43	29	13	20	22	8	163
2002	25	32	16	14	21	44	7	159
2003	8	45	18	28	14	33	9	155
10 Yr Total	300	488	249	176	198	274	71	1783

Note: The totals for each year may not equal the total because of a small amount of cases where no age was noted on the accident report.

Source: TIS – Montana Department of Transportation

10. Truck Involvement In Crashes

This section examines Montana crashes involving trucks. The table that follows contains a ten-year history of truck-involved crashes within the state. There is sometimes confusion with data from other databases, which contain "commercial" truck information. Those databases will not coincide completely with the data from the Highway Patrol Crash database. The definitions are not identical. The commercial truck definition excludes some trucks that will be reported on the state crash reporting form.

The number of truck crashes reached a high in 1996 and has decreased by nearly 25% over the six years since then, although increasing slightly during the past two years. The number of fatal crashes involving trucks increased slightly during 2003.

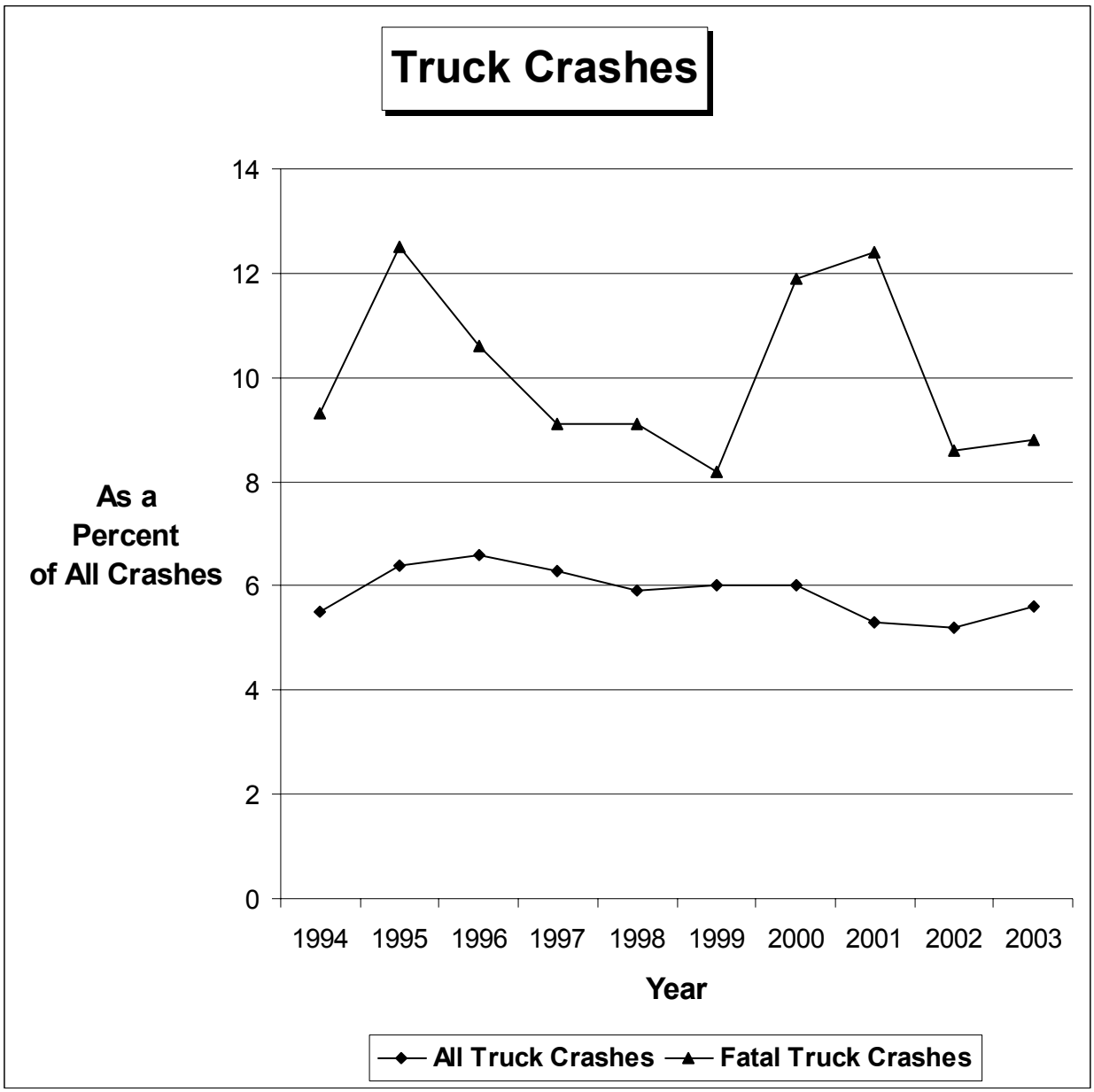
Table 45
Number of Crashes Involving Trucks

Year	Crashes		Fatal Crashes	
	Number	Percent of all Crashes	Number	Percent of all Fatal Crashes
1994	1056	5.5%	17	9.3%
1995	1314	6.4%	27	12.5%
1996	1646	6.6%	21	10.6%
1997	1426	6.3%	24	9.1%
1998	1310	5.9%	19	9.1%
1999	1262	6.0%	16	8.2%
2000	1346	6.0%	24	11.9%
2001	1159	5.3%	25	12.4%
2002	1228	5.2%	20	8.6%
2003	1288	5.6%	21	8.8%
Chg 1 Year	+4.9%	+7.7%	+5.0%	+2.3%
Chg 5 Year	+2.1%	-1.4%	+1.0%	-12.4%

Source: TIS - Montana Department of Transportation

Figure 23 on the following page shows the number of truck crashes as a percentage of all motor vehicle crashes and fatal truck crashes as a percentage of all motor vehicle fatal crashes.

Figure 23


Truck Crashes
As a Percent of All Crashes
14
12
10
8
6
4
2
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
Year
All Truck Crashes
Fatal Truck Crashes

This table presents the type of trailer for trucks. All configuration types had a high number of crashes during 1996, which were likely caused by abnormally icy roads. These counts include trucks and truck/tractor combinations. They also include trucks, which are towing other types of trailers, which could include boat trailers, house trailers and utility trailers.

Table 46
Truck Crashes by Trailer Type

	Crashes				Fatal Crashes			
Year	No Trailer*	Single Trailer	Double Trailer	Triple Trailer	No Trailer	Single Trailer	Double Trailer	Triple Trailer
1994	266	687	100	3	3	12	2	0
1995	462	734	117	1	8	13	6	0
1996	467	1014	163	2	7	13	1	0
1997	424	893	106	3	3	18	3	0
1998	393	785	131	1	5	12	2	0
1999	336	800	125	1	5	8	3	0
2000	328	905	111	2	5	19	0	0
2001	335	722	102	0	2	20	3	0
2002	340	801	84	3	6	12	2	0
2003	470	712	100	6	8	13	2	0
Chg 1 Yr	+38.2%	-11.1%	+19.0%	+100%	+33.3%	+8.3%	---	---
Chg 5 Yr	+35.7%	-11.3%	-9.6%	+329%	+73.9%	-8.5%	---	---

Source: TIS – Montana Department of Transportation

* Trucks with no trailer would include single unit vehicles. They could also include Tractor-Trucks that currently are not pulling a trailer.

11. Other Issues and Information

a. Buses and Unusual Vehicle Involvement in Crashes

This section displays data for unusual vehicles such as buses, ambulances, farm machinery and fire trucks. Table 47 contains data on the number of these unusual vehicles involved in crashes for a ten-year period.

Table 47
Unusual Vehicle Types in Crashes

Year	School Bus	Bus	Ambulance	Farm Machinery	Fire Truck	Snow-mobile
1994	60	66	10	16	8	13
1995	47	57	9	19	4	9
1996	71	91	11	33	11	15
1997	73	71	14	32	12	14
1998	48	58	11	32	15	13
1999	63	60	9	16	8	12
2000	59	67	10	23	11	5
2001	65	69	8	15	12	6
2002	83	76	13	16	5	4
2003	66	63	11	18	10	3
Chg 1 Yr	-20.5%	-17.1%	-15.4%	+12.5%	+100.0%	-25.0%
Chg 5 Yr	+3.8%	-4.5%	+7.8%	-11.8%	-2.0%	-62.5%

Source: TIS – Montana Department of Transportation

Farm machinery and snowmobile crash numbers were well below the five-year average. Snowmobiles certainly seem to be trending down over the long term. School bus and ambulance crash numbers were slightly higher than the five-year average.

b. Collisions with Animals or Avoidance

During the seventeen-year period from 1984 to 2000, the number of crashes involving wild animals steadily increased from 468 to 1891. During 2001 and 2002 these reported crashes declined some but reached an all time high during 2003. The key word in the previous sentence is 'reported', since many collisions with animals are not reported. When analyzing this increase, it is possible that the percentage of collisions with animals being 'reported' is changing. Are more crashes being reported for economic reasons? The long-term trend is shown on the following page in Figure 24. The number of crashes involving domestic animals has shown no trend over the years.

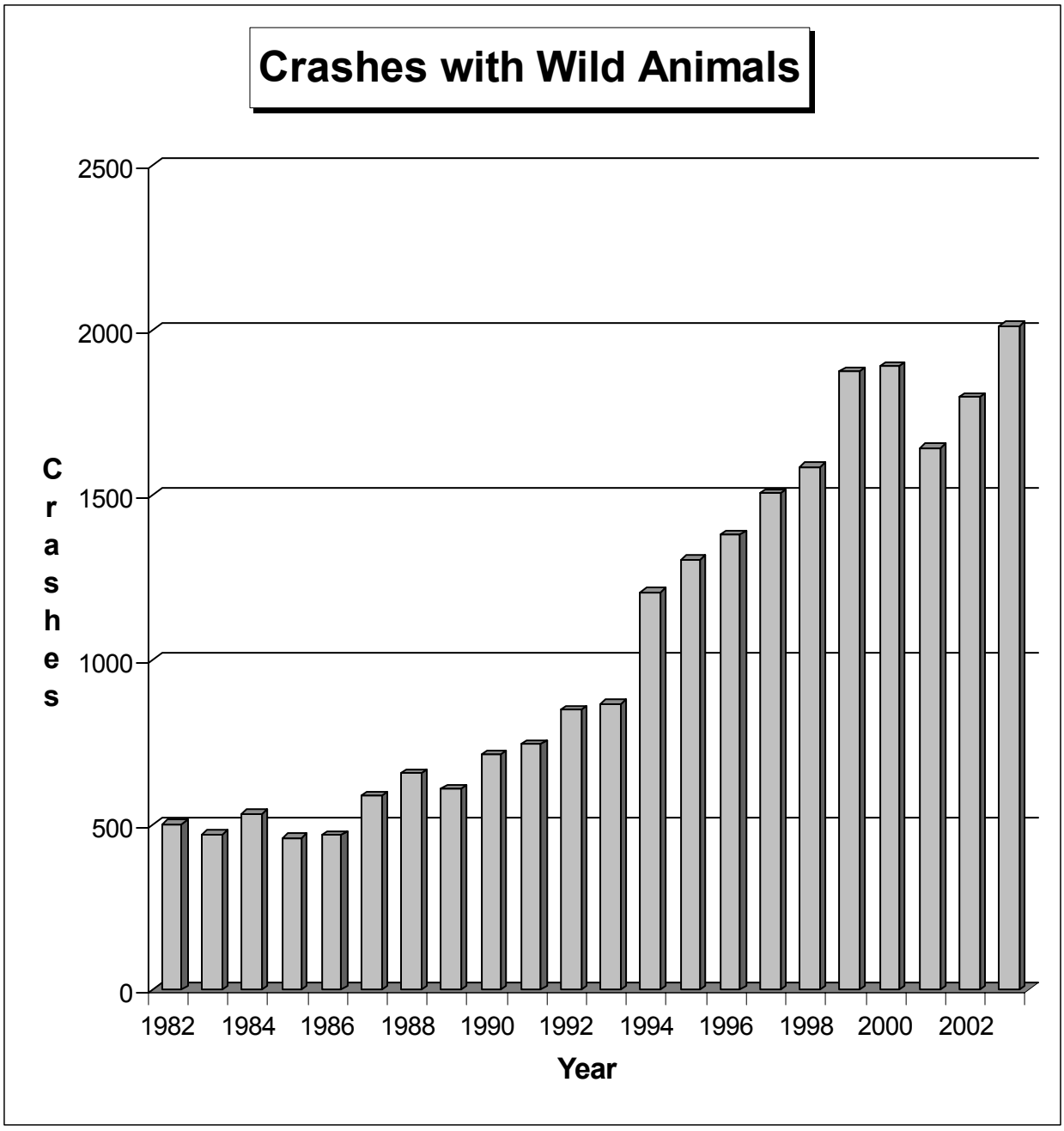
Table 48
Crashes Involving Animals

Year	Crashes With Wild Animals	Fatal Crashes With Wild Animals	Crashes With Domestic Animals	Fatal Crashes With Domestic Animals
1994	1,205	1	269	0
1995	1,305	5	287	1
1996	1,381	2	250	0
1997	1,506	3	241	3
1998	1,585	0	262	2
1999	1,875	0	298	2
2000	1,891	1	237	1
2001	1,643	3	201	1
2002	1,796	3	239	3
2003	2,012	3	234	1
Chg 1 Year	+12.0%	---	-2.1%	-66.7%
Chg 5 Year	14.4%	+114.3%	-5.4%	-44.4%

Source: TIS – Montana Department of Transportation

The Department of Transportation keeps a database, which accounts for animals that are picked up off the roadways by the Maintenance Division. The assumption that these carcasses were the result of collision with motor vehicles would seem valid. This count of carcasses should provide us with another estimate of the number of animal crashes. These numbers are from 3½ to four times higher than reported crashes This ratio points toward the conclusion that no more than 25 to 30 percent of collisions with animals are being reported on crash reports.

Figure 24


Crashes with Wild Animals
2500
2000
1500
1000
500
0
Crashes
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year

c. Railroad Crossing Safety

Motor vehicle collisions with trains are a relatively rare event, but the severity of such collisions tends to be very high. Table 49 presents a history of these collisions on public roadways in Montana for rural roads and for all roadways. Crashes in rural areas may be declining.

Table 49
Collisions with Trains

Year	Rural			Total		
	Crashes	Fatal Crashes	Injury Crashes	Crashes	Fatal Crashes	Injury Crashes
1994	18	0	8	23	0	10
1995	11	2	4	16	3	5
1996	24	3	10	27	3	11
1997	20	0	11	28	0	16
1998	16	2	6	24	2	11
1999	11	1	4	12	1	4
2000	19	1	6	22	1	6
2001	7	0	2	9	0	2
2002	9	1	3	20	2	6
2003	2	0	0	19	3	3
Chg 1 Yr	-77.8%	-100.0%	-100.0%	-5.0%	+50.0%	-50.0%
Chg 5 Yr	-83.9%	-100.0%	-100.0%	+9.2%	+150.0%	-48.3%

Source: TIS – Montana Department of Transportation

E. COUNTY RANKING

The following section places a ranking on the 56 counties in Montana. The ranking helps to determine funding level for safety programs. The first three categories are indices of traffic safety problems, while the last two indicate levels of local enforcement in two leading traffic safety areas.

Table 50
County Ranking for Traffic Safety Programs and Funding

Rank	County	Severe Crash Rank	Alcohol Crash Rank	Ped+Bike +Mcycle Rank	DUI Conv Rank	Restraint Conv Rank	Sum of Ranks
1	Missoula	1	2	2	3	1	9
2	Yellowstone	2	1	1	2	5	11
3	Gallatin	5	5	3	1	7	21
4	Cascade	6	4	4	4	4	22
5	Flathead	3	3	6	5	6	23
6	Lewis and Clark	8	6	5	6	2	27
7	Silver Bow	11	13	8	8	3	43
8	Lake	7	7	13	9	13	49
9	Ravalli	4	8	7	7	26	52
9	Lincoln	9	10	10	11	12	52
11	Glacier	10	15	9	12	17	63
12	Hill	21	9	18	10	9	67
13	Park	15	11	13	13	21	73
14	Sanders	12	17	13	23	15	80
15	Carbon	16	13	10	19	23	81
16	Jefferson	14	12	16	24	16	82
17	Fergus	17	19	12	21	23	92
18	Beaverhead	17	23	21	26	19	106
19	Custer	33	31	24	14	8	110
20	Roosevelt	21	18	22	35	17	113
21	Richland	24	20	46	17	9	116
22	Deer Lodge	23	33	16	18	32	122
23	Stillwater	17	20	30	30	26	123
24	Madison	27	15	22	28	32	124
25	Valley	30	23	30	28	19	130
26	Dawson	34	34	18	16	32	134
26	Blaine	38	34	30	19	13	134
28	Big Horn	20	23	46	15	32	136
29	Sweet Grass	26	30	24	34	26	140

Table 50 (continued)

County Ranking for Traffic Safety Programs and Funding

Rank	County	Severe Crash Rank	Alcohol Crash Rank	Ped+Bike +Mcycle Rank	DUI Conv. Rank	Restraint Conv. Rank	Sum of Ranks
30	Broadwater	34	23	18	27	40	142
31	Powell	13	27	30	33	40	143
32	Mineral	25	20	46	25	32	148
33	Rosebud	29	28	46	22	32	157
34	Pondera	30	28	24	41	40	163
35	Phillips	34	38	24	32	40	168
36	Granite	27	38	24	40	40	169
37	Musselshell	41	43	30	30	26	170
38	Teton	34	31	39	36	40	180
39	Chouteau	30	37	39	36	40	182
39	Toole	40	34	24	44	40	182
41	Meagher	41	49	30	38	26	184
42	Powder River	38	49	30	45	26	188
43	Sheridan	48	41	30	38	32	189
44	Daniels	48	43	39	48	21	199
45	Fallon	52	40	46	51	11	200
46	Golden Valley	46	41	46	45	32	210
47	Treasure	52	52	39	45	23	211
48	Wheatland	45	46	46	42	40	219
49	Judith Basin	41	52	39	48	40	220
49	Carter	41	49	39	51	40	220
51	McCone	48	43	39	51	40	221
52	Prairie	48	46	46	42	40	222
53	Liberty	52	55	30	51	40	228
54	Garfield	46	52	46	48	40	232
55	Wibaux	56	46	46	51	40	239
56	Petroleum	52	55	46	51	40	244

Source: TIS – Montana Department of Transportation

The five rankings are summed and then those totals are ordered. This table can be used as a very general ordering for traffic safety problems and solutions by county. Lincoln, Sanders, Jefferson, Roosevelt and Richland Counties have moved up within the ranking, while Custer, Big Horn and Powell Counties have dropped.

Dispersal of traffic safety monies will be distributed somewhat according to this table. Some counties or cities within counties will have special safety problems that are not represented by the above table and these instances will at times be taken into account. Many counties and cities will not have sufficient resources to manage an attack on their

safety problems. Sometimes, several counties or cities may work together on certain issues.

Cost benefit is a factor when aiding counties. If a large benefit can be gained with a small amount of money, this could override aiding a project in a higher priority county. There is a limited amount of funding and sometimes this funding is earmarked to certain areas. This and other factors may also override priorities.

Conclusion

This Problem Identification for FY 2005 explores many traffic safety issues in Montana. It is a compilation, which contains a large amount of varied data. There is much statistical "noise" in the various data, since there are so many variables that affect crashes including driver behavior, vehicles, roads, weather, laws and even something as simple as a change to a reporting form. It is difficult to reach significance because of these many factors along with the relatively small number of crashes and fatal crashes in the state. An example of this for the year 2001 is a large reduction (16.8%) in injuries. It has been difficult to explain this sudden decline after many years with minimal change. Very little changed between 2000 and 2001 and the factors that did change do not seem to have caused this decrease.

This paper should be used as a guide when looking at the traffic safety problem or when attempting to find solutions for Montana traffic safety. Often it is safer to look at long-term trends, rather than a one-year increase or decrease which may have occurred from something as simple as an unusual winter. Winters with icy road conditions usually increase the number of property damage crashes while open winters with few icy road conditions usually increase fatal crashes. Perhaps a particular traffic safety intervention had no impact at all, but some other variable created the perceived result. Care should always be given that you don't make assumptions for the cause of certain situations without looking at all possibilities. When in doubt one should error on the side of caution.

Questions or comments on this study should be directed to the State Highway Traffic Safety Office at the Montana Department of Transportation. For additional information call the bureau at (406) 444-3298.